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The purpose of this study was to examine the effectiveness of Duet Reading, a peer-mediated repeated reading strategy, for increasing the reading fluency of four diverse ninth and tenth grade students with learning disabilities in a large public high school. The effects of Duet Reading on comprehension were explored as well. A multiple probe single-subject design across two groups of students was used to evaluate the effectiveness of the intervention. The students were placed in dyads based on similar fluency training levels and the intervention was administered in a staggered fashion according to the dictates of the multiple probe design. Dependent measures included the number of words correct per minute and errors per minute along with pre-post data on the Test of Oral Reading Fluency (TORF) and the comprehension subtest of the Woodcock Reading Mastery Test. Social validity data were also collected. Results of the study revealed that no functional relationship existed between the Duet Reading intervention and the students' oral reading fluency. However, two of the students' oral reading fluency rates increased, with modest gains in comprehension. Despite limited results, overall, the students felt that the intervention was beneficial and helped them become better readers. Results are discussed in terms of previous research, limitations, as well as implications for current practice.

THE EFFECTS OF DUET READING ON THE READING FLUENCY AND COMPREHENSION OF HIGH SCHOOL STUDENTS WITH LEARNING DISABILITIES

by

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APPROVAL PAGE

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CHAPTER I

INTRODUCTION

Background

Reading is a purposeful and complex cognitive and social process in which readers simultaneously use their knowledge of spoken and written language, of subject matter, and of their culture to construct meaning from the texts they encounter. It requires decoding, accurate and fluent word recognition, and comprehension at the word, phrase, sentence, and text levels. It is not a technical skill that is only acquired in the elementary grades, but a developmental process (Kucer, 2005). A reader's competence grows through extensive reading and through engagement with various types of texts for various purposes over a lifetime, and an understanding of the text is constructed by use of a reader's background knowledge.

In a perfect world, children "learn to read" by second or third grade, and then they are supposed to "read to learn" for the rest of their lives. In a perfect world, children would not still be learning to read in middle or high school. Unfortunately, educators are reminded every day that this is not a perfect world. Staggering numbers of adolescents struggle with reading and face new challenges that potentially affect their reading achievement (Kamil, 2003; Scammacca et al., 2007). Even for students who experience reading success early, the literacy demands of high school can pose considerable challenges. When adolescents are poor readers, they experience difficulty in all aspects

of the curriculum. They also have lower self-esteem, pose greater disciple problems, and are less likely to finish high school (Kamil, 2003; Roberts, Torgesen, Boardman, & Scammacca, 2008).

Older students must be able to comprehend texts that are more complex; determine the meaning of obscure, unfamiliar, and technical vocabulary; and use higher-order thinking skills to analyze a wide variety of literacy and expository texts and media (Torgesen et al., 2007). In order to do so, they must be able to decode fluently and comprehend material with challenging content. Secondary students also face increasing accountability measures along with the pressure to meet the demands of more difficult curricula and content (Swanson & Hoskyn, 2001). In the past decades, students have become responsible for learning that complex content at a rapid pace in order to meet state standards and to pass outcome assessments (Woodruff, Schumaker, & Deschler, 2002). The effects of these high-stakes tests on instructional programs at all levels of public schooling is well recognized (Allington, 2001). State mandates requiring teachers to cover curriculum objectives, often at the expense of student understanding of content, exacerbate the problem. Such demands make continual instruction in reading beyond the early grades imperative, resulting in particular attention given to the reading development of adolescents because the ability to read is the most essential academic skill needed for success in high school (Kamil, 2003; Rasinski et al., 2005).

The expenditure of funds from the federal government for reading programs is not new. Prior to the implementation of NCLB, funding and program development that focused on early intervention has been in place for decades. However, despite decades of

federal funding for early reading intervention, many students still reach adolescence with longstanding reading difficulties (Faggella-Luby & Deshler, 2008). Significant numbers of adolescents in the United States do not read and/or write at levels needed to meet the demands of the 21st century. According to the 2008 National Assessment of Educational Progress (NAEP), the average reading score for 17-year-olds was higher in 2008 than in 2004, but was not significantly different from the scores in 1971. This lack of improvement for high schoolers is discouraging and serves as a wake-up call for the education profession. It stresses the need for educators to do more to ensure that students are continuing to learn to read throughout elementary, middle, and high school, and are prepared for higher education and the workforce. The NAEP report on high school performance also confirms what employers, college professors, and high school graduates themselves are saying about the expectation gap between what is expected of high school students and what it takes to be successful after graduation (Bishop, 1994; Kamil, 2003).

The lack of progress in reading performance for high schoolers is particularly distressing for students classified as struggling readers or having identified disabilities in reading. These readers often lack sufficient decoding, fluency, vocabulary, and comprehension skills to master complex content (Kamil, 2003). Despite years of remedial reading, many struggling high school readers still cannot independently read passages beyond the first and second grade levels, do not possess sufficient word identification strategies, and read at very slow rates (Devault & Joseph, 2004; Kamil, 2003). Students need to be able to read material at least at a basic level when they

advance to higher-level texts that contain more complex vocabulary and abstract conceptual relationships (Salinger, 2003).

In addition to problems with word identification and fluency, many adolescents with learning disabilities transition to high school having under-developed language, literacy, and executive functioning skills (Gartland & Strosnider, 2008). These language deficits become more pronounced as demands increase in vocabulary, content specific knowledge, organization, and retrieval of semantic information. It is not surprising that struggling readers have difficulty maintaining motivation and persistence at the levels necessary for academic success. These problems are further complicated by their limited awareness of their individual strengths, and the remediation and accommodations needed to ensure their progress (Gartland & Strosnider, 2008).

Students with learning disabilities in reading present difficult instructional challenges as well (Roberts et al., 2008). They tend to struggle with several components of reading such as difficulties in identifying new or unfamiliar words, lack of fluency in reading text, or comprehension. These weaknesses, if not corrected in elementary school, persists through high school and cause students to fall further behind academically because of their inability to successfully access grade level text. The impact of these reading deficits is significant to society, and the consequential socio-emotional risks for these high school students are profound. The data indicate that we as educators are not ensuring that all adolescents are sufficiently prepared for the academic challenges they face in reading, and challenge us to identify methods to promote reading development at this level.

Statement of the Problem

While there is considerable knowledge and research about beginning reading practices for young children, the knowledge and practices for teaching older students (grades 6 and older) who struggle with reading has been less systematically studied and reviewed (Biancarosa & Snow, 2004). What can teachers do to assist these at-risk readers? The National Reading Panel (NRP) report (2000) identified five areas essential to effective early reading instruction: (a) phonemic awareness, (b) phonics, (c) fluency, (d) vocabulary, and (e) comprehension. High school students who struggle with reading often have challenges in several of these domains (Archer, Gleason, Vachon, 2003) and all of these must be applied automatically, in tandem, in order for comprehension to occur (Adams, 1990). One foundational reading domain is oral reading fluency. Students who struggle with reading often read in a slow, halting manner, which affects how much information they can gain and may even lead to exhaustion (Archer et al., 2003). The NRP report states, "Fluency is one of several critical factors necessary for reading comprehension" (NRP, 2000, p. 11). Fluency is defined as the ability to read connected text effortlessly with accuracy, speed, and expression and with little conscious attention to the mechanics of reading (Meyer & Felton, 1999).

The ability to read accurately and automatically is especially important for secondary students with learning disabilities in reading who are faced with challenging content-area material through text reading on a daily basis (Dudley, 2005; Fuchs, Fuchs, Hosp, & Jenkins, 2001). Research indicates while high school students with learning disabilities struggle in all areas of reading, fluency and comprehension are the areas

where they have the most difficulty (Hock et al., 2009). Indeed, if students do not recognize words with automaticity, they spend considerable time decoding rather than deriving meaning from text. The connection between oral reading fluency and comprehension will be covered in more detail in the next section.

Theoretical Framework

One explanation for the connection between fluency and comprehension comes from LaBerge and Samuels (1974). They proposed a theory of automaticity or automatic information processing stating that to be an efficient reader, a student needs to be able to recognize and identify words instantly and then connect the words as they read to make meaning. If readers have not developed automaticity in word recognition, then the efforts they expend in decoding will limit the efforts they direct to comprehension. Conversely, the more automatic the decoding, the more attentional resources they will have available to direct towards comprehension. Hence, comprehension is negatively affected by a reader's lack of fluency. Increases in student fluency should result in increases in comprehension. Because comprehension is the means through which information is acquired from text, it is essential to increase the reading fluency of students with learning disabilities who read slowly to allow them to concentrate on comprehending text.

While the relationship between reading fluency and comprehension is well established, research is equally clear that the relationship is not causal, especially for struggling adolescent readers (Scammacca et al., 2007). There are factors that play a role in a student's ability to gain meaning from text other than reading words accurately and rapidly. These include: (a) noting the structure and organization of text; (b) monitoring

their understanding while reading; (c) using summaries; (d) making predictions, checking them as they read, and revising and evaluating them as needed; (e) relating content to prior knowledge; (f) understanding the meaning of vocabulary; and (g) making inferences and using visualization (Edmonds et al., 2009; Israel & Duffy, 2009; Kamil, 2003). These factors prove that it takes more than being able to automatically and accurately recognize words to understand connected text. However, the fact that the relationship between fluency and comprehension is not causal does not mean that fluency is not a worthwhile skill to teach. Indeed, while fluency is not sufficient for reading comprehension, it is certainly necessary.

Rationale

Two questions come immediately to mind in stating a rationale for this study. First, why is another study needed showing that repeated reading increases reading fluency? Second, why is a study on building fluency needed at all when its positive effect on reading comprehension, the ultimate aim of reading instruction, is far from guaranteed? With regard to the first question, research on fluency interventions such as repeated reading does already tell us that words per minute increase when repeated reading interventions are implemented. However, researchers recently suggested that repeated reading is not supported by rigorous research standards, and as such, has yet to be accepted as an evidence-based practice for students with and at risk for learning disabilities (Chard, Ketterlin-Geller, Baker, Doabler, & Apichatabutra, 2009). Thus, more studies on repeated reading with this population of students are needed. It is also true that the few studies of repeated reading conducted with adolescents have not shown

significant effects (Scammacca et al., 2007). Nevertheless, this evidence is far from conclusive, and does not suggest educators should forgo instruction in fluency skills, particularly for older students whose word reading skills are extremely low. Research on repeated reading is beneficial and special education researchers should continue to examine its efficacy for building reading fluency in students with learning disabilities using scientifically based methods. Duet reading, the fluency intervention used in this study, is a type of repeated reading, but has additional components geared to adolescents such as peer-mediated practice, student choice, goal setting, and self-monitoring. These additional components may prove beneficial for struggling adolescent readers and should add significance to the current literature on fluency interventions.

With regard to the second question, previous fluency research does indicate fluency gains can result in no substantial gains in comprehension (Edmonds et al., 2009; Kuhn & Stahl, 2003; Morris & Mather, 2008; Roberts et al., 2008; Scammacca et al., 2007). On the other hand, there is also research demonstrating that repeated reading results in concomitant increases in comprehension (Homan, Klesius, & Hite, 1993; NRP, 2000; O'Shea, Sindelar, & O'Shea, 1985, 1987; Rasinski, 2006; Therrien, 2004). Research has also shown that children who have difficulty comprehending, read text more slowly and recognize fewer words in isolation than do their more competent peers (Perfetti, 1985). Studies on the relationship between students' rate of oral reading and performance on standardized reading comprehension tests have demonstrated high correlations between these measures making the relationship between fluency and comprehension reciprocal in nature (Allinder, Dunse, Brunken, & Obermiller-

Krolikowski, 2001). This reciprocal theory recognizes not only that a reader must be reading fluently in order to comprehend what is being read, but that as a student is able to comprehend, his or her reading may become more fluent. Finally, the ability to read fluently is an important aspect of how a reader plans, directs, and integrates the cognitive and linguistic strategies needed for accurate comprehension (Wolf & Katzir-Cohen, 2001). For all these reasons, an examination of Duet Reading's impact on comprehension as well as oral reading fluency could make a valuable contribution to the reading research.

Purpose of the Study and Research Questions

The purpose of this study was to examine the effectiveness of Duet Reading, a variation of repeated reading, on the reading fluency and comprehension skills of high school students with learning disabilities. Duet Reading involves two students with similar reading levels and oral reading rates reading the words of a graded passage together, with each student reading every other word. While there are no research studies to date validating the effectiveness of Duet Reading, its components incorporate a number of teaching strategies that have a strong research base such as repeated reading (Kuhn & Stahl, 2003; Meyer & Felton, 1999; Therrien & Kubina, 2006), peer-mediated practice (Fuchs, Fuchs, & Kazdan, 1999; Yurick, Robinson, Cartledge, Lo, & Evans, 2006), goal setting (Eckert, Ardoin, Daisey, & Scarola, 2000; Eckert, Ardoin, Daly, & Martens, 2002; Mercer, Campbell, Miller, Mercer, & Lane, 2000), self-monitoring, self-evaluation (Manset-Williamson & Nelson, 2005; Sutherland & Snyder, 2007), and student choice (Guthrie et al., 2006). Further, a pilot study involving Duet Reading,

conducted by Jones and Bursuck (2007) resulted in significant gains in fluency for both of its adolescent students with learning disabilities. The study's findings, while preliminary, show promise and reinforce the need for a better-controlled study of this teaching strategy. Therefore, for this study, the research questions are:

1. What is the impact of Duet Reading on the reading fluency of high school students with learning disabilities?
2. What is the impact of Duet Reading on the comprehension skills of high school students with learning disabilities?

It was hypothesized that if students with reading disabilities participate in this fluency intervention, their reading fluency would increase and their comprehension skills might increase.

Definition of Terms

Automatic Word Recognition (automaticity)—Quick, accurate, and effortless word recognition at the single word level (Samuels & Farstrup, 2006).

Decoding – This term describes the reader's understanding that the sequence of letters in written words represents the sequence of sounds in spoken words and the reader's ability to translate the letters and patterns of written words into speech sounds automatically (Kuhn & Stahl, 2003)

Fluent Readers—A stage of reading development, usually experienced by students at the end of second grade and beginning of third grade, at which students identify words with greater skill and ease, and begin to apply more complex comprehension strategies. These readers can read text with speed, accuracy, and proper

expression. Using their extensive bank of sight words and refined decoding skills, they can focus more time and effort on the meaning of texts and less on deciphering words. Their reading sounds natural, like regular conversation. (NRP, 2000; Rasinski, 2004).

Passage Reading Rate—The speed at which accurate oral passage reading takes place (Samuels & Farstrup, 2006). The number of words read correctly in a specified amount of time (usually a minute). Reading rate is often used synonymously with the term fluency as it provides a means for determining a reader's word and text reading speed.

Phoneme—The smallest unit of sound that can change the meaning of a word (NRP, 2000).

Phonemic Awareness—The ability to pay select attention to and recognize sound structures of language rather than to word meaning. Well-developed phonemic awareness allows a listener to (a) interpret meaning based on phoneme distinctions, and (b) to segment, identify, locate, and sequence phonemes. These abilities are believed to be important precursors to reading (NRP, 2000).

Phonological Awareness—The ability to recognize and manipulate the sound structures of oral language (NRP, 2000).

Prosody—The ability to read words in connected text correctly and in a way that mimics the rhythm and flow of normal speech. A compilation of spoken language features that includes stress or emphasis, pitch variations, intonation, reading rate, and pausing (Dowhower, 1991; Samuels & Farstrup, 2006).

Reading Comprehension—"The active process of getting meaning from written text" (Bursuck & Damer, 2007). It involves making connections among words and ideas presented in a text and the readers own background knowledge.

Reading Fluency—Reading speed and accuracy as measured by the number of words read correctly per minute.

Repeated Reading—The process of rereading a short, meaningful passage several times until a satisfactory level of fluency is attained (Samuels, 1979).

Word Recognition Accuracy—The ability to recognize and decode words correctly (Samuels & Farstrup, 2006).

Dissertation Overview

The next chapter provides an extensive review of the literature on reading fluency. It begins with an overview of the importance of reading fluency, its relationship to comprehension, followed by the impact dysfluent reading has on adolescents. Various definitions of reading fluency are discussed as well as its theoretical framework. The chapter concludes with a review of studies on reading fluency interventions for struggling adolescent readers. The methods and procedures that guided the investigation are reported in Chapter III. In Chapter IV, the data from the study are presented, including both quantitative findings and general themes from social validity data collected from the participants. A summary of the findings, implications of the research, and recommendations for further research is included in Chapter V.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Many students reach adolescence with longstanding reading difficulties despite funding and program development that focus on early intervention (Faggella-Luby & Deshler, 2008). Whether this is a result of inadequate access to earlier intervention, poorly implemented intervention, or failure to follow up effectively, significant numbers of students reach high school with reading difficulties that affect their progress across the curriculum and have a negative impact on their academic achievement (Faggella-Luby & Deshler, 2008). The need for effective intervention strategies for these older individuals is just as great as the need for interventions for younger children because of all the emotional overlays that become apparent as students mature and continue to encounter significant failure (Deshler, 2005). Older, struggling readers must be given more individualized, intensive instruction with more opportunities to practice reading by using reading programs centered on empirically proven methods (Chard et al., 2009).

The ability to read, comprehend, and apply knowledge to novel learning situations is essential, especially at the high school level. In fact, if students cannot adequately decode words and comprehend text, much knowledge will be beyond their grasp. Secondary students have become responsible for learning more complex content at a rapid pace in order to meet state standards and pass outcome assessments (Woodruff et

al., 2002). They are expected to decode fluently and comprehend material with challenging content. However, some struggling high school readers, especially those with reading disabilities, lack sufficient advanced decoding, fluency, vocabulary, and comprehension skills to master the complex content. They read slowly and with effort, laboring over unfamiliar words spending less time reading than their non-disabled peers do. As a result, they have less developed sight word vocabularies and read less fluently (Roberts et al., 2008) and the vicious cycle continues. Such is the importance of reading fluency to being a successful reader.

The purpose of this chapter is to perform a comprehensive review of the literature pertaining to reading fluency. This review begins with a discussion of the importance of reading fluency and its relationship to comprehension, followed by the implications of dysfluent reading for struggling adolescent readers. The next section presents the various definitions and aspects of reading fluency. The subsequent sections discuss fluency's historical foundations and then summarize the theoretical framework surrounding the development of fluency as well as its importance as a part of literacy instruction. The ensuing sections include a summary and analysis of studies of interventions designed to improve the reading fluency of adolescents who struggle in reading.

Importance of Reading Fluency

Fluency has begun to gain substantial attention in the research literature because it is essential to the development of skilled reading (Kuhn & Stahl, 2003). In 1997, congress asked the National Institute of Child Health and Human Development, along with the U.S. Department of Education, to form the National Reading Panel to review

research on how children learn to read and determine which methods of teaching reading were most effective based on the research evidence. The panel's analysis indicated that the best approach to reading instruction is one that incorporates explicit instruction in phonemic awareness, systematic phonics instruction, ways to enhance comprehension, and methods to improve fluency (NRP, 2000). The report from the panel states, "Fluency is one of several critical factors necessary for reading comprehension" (NRP, 2000, p. 11). Though it was once coined the "most neglected component of reading" (Allington, 1983), reading fluency has received considerable attention from researchers, practitioners and educational policy makers in the past two decades (Chard, Vaughn, & Tyler, 2002; Fuchs et al., 2001; McCardle & Chhabra, 2004; NRP, 2000; Wolf & Katzir-Cohen, 2001). Fluent readers are able to read orally with speed, accuracy, and proper expression making fluency one of the several critical factors necessary for reading comprehension. However, despite its importance as a component of skilled reading, fluency is often not taught in the classroom (Rasinski, 2006b).

Non-fluent readers read in a laborious and inefficient manner making it difficult for them to remember what has been read and to relate the ideas expressed in the text to their background knowledge. Research shows that it is not enough just to read words correctly (Rasinski, 2006b). In order for a reader to be competent, he or she must read fluently and smoothly. Therefore, it is important to give attention to each developing reader's fluency levels. Fluency includes the ability to read words correctly and quickly, and includes phrasing and expression. If a student has to stop to sound words out, reading fluency, along with comprehension, is disrupted (Rasinski, 2006b). Some

students who struggle to learn to read are able, with appropriate instruction, to compensate for initial reading problems by becoming accurate decoders; nevertheless, they fail to reach a level of sufficient fluency to become fast and efficient readers (Rasinski, 2006b). As a result, the development of techniques for improving automaticity and fluency is critical and essential for the development of reading proficiency.

Relationship between Fluency and Comprehension

The reading process involves two separate but highly interrelated areas—word identification and comprehension (Armbruster, Lehr, & Osborn, 2001; Bashir & Hook, 2009; Chard, Pikulski, & McDonagh, 2006; LaBerge & Samuels, 1974; Klauda & Guthrie, 2008; Pikulski & Chard, 2005). Difficulties in automatically identifying words can affect a reader's ability to comprehend what they are reading (Rasinski, 2006b). Even mild difficulties in word identification can not only draw attention away from the underlying meaning of a passage, but also reduce the speed of reading and create the need to reread selections to grasp the meaning. The ability to recognize words rapidly frees up space in the reader's working memory for use in comprehending the message of the text. To be precise, fluent readers need to put less effort into word recognition and therefore have more available for comprehension.

Reading comprehension is affected by the speed and accuracy with which words are decoded. Fluent readers can focus their attention on the meaning of text being read because they are not forced to pause to decode unfamiliar words. This allows them to simultaneously read and comprehend (Rasinski, 2006b). Students with dyslexia or

related learning disabilities devote so much energy to figuring out unknown words that comprehension suffers (Therrien, 2004; Wolf & Katzir-Cohen, 2001).

The National Assessment of Educational Progress (NAEP) established that there is a "significant and positive relationship between oral reading fluency and reading comprehension" (Pikulski & Chard, 2005, p. 510). This relationship between fluency and comprehension is also addressed in the NRP's Report (2000):

> Why do problems with reading accuracy, speed, and expression interfere with comprehension? To answer this question, we need to examine the reading process in terms of two basic cognitive tasks. The reader must recognize the printed words (decoding) and construct meaning from the recognized words (comprehension). Both decoding and comprehension require cognitive resources. At any given moment, the amount of cognitive resources available for these two tasks is restricted by the limits of memory. If the word recognition task is difficult, all available cognitive resources may be consumed by the decoding task, leaving little or nothing for use in interpretation. Consequently, for the nonfluent reader, difficulty with word recognition slows down the process and takes up valuable resources that are necessary for comprehension. Reading becomes a slow, labor-intensive process that only fitfully results in understanding. (p. 3)

In "The Fluent Reader," Hoffman (2003) states "The interface between fluency and comprehension is quite tight" (p. 5). In other words, when students begin to decode automatically, they are able to concentrate more on meaning. Through active comprehension strategies, such as reading aloud with appropriate and meaningful expression, readers are more likely to develop a satisfactory understanding of the texts they read (Rasinski, 2006b). Some reports indicate that fluency is a building block to comprehension and must exist before comprehension can occur (Armbruster et al., 2001; Pikulski & Chard, 2005). Other reports indicate that reading rate, accuracy, and

automaticity make reading easier and allow the reader to focus on, and the brain to process the more complex tasks associated with comprehension (Kuhn & Stahl, 2003; Meyer & Felton, 1999; Rasinski, 2006b; Wolf & Katzir-Cohen, 2001).

However, other researchers downplay the role of fluency in comprehension and posit further that fluency may develop independently with opportunities of wide reading rather than needing to be supported by instruction (Nathan & Stanovich, 1991; Pikulski & Chard, 2005). Indeed, the relationship between fluency and comprehension is complex and a matter of debate. Strecker, Roser, and Martinez (1998) summed up this debate in their review of fluency research: "The issue of whether fluency is an outgrowth of or a contributor to comprehension is unresolved. There is empirical evidence to support both positions" (p. 300). Because of their discussion they concluded, "Fluency has been shown to have a 'reciprocal relationship' with comprehension, with each fostering the other" (p. 306).

Researchers who stress the complexity of the relationship between fluency and comprehension call attention to the fact that a reader's comprehension and fluency strategies are affected by other factors such as the extent to which they find the material interesting (Applegate, Applegate, & Modla, 2009; Dowhower, 1991; Strecker, Roser, & Martinez, 1998; Walczyk & Griffith-Ross, 2007). Others insist that the fluency instruction given to struggling readers must be multidimensional if students are to learn to respond to text reflectively and intelligently (Hudson et al., 2009; Pikulski & Chard, 2005; Pressley, Gaskins, & Fingeret, 2006). Still others have suggested that the development of fluency must require opportunities to engage in critical and meaningful

discussion of text (Griffith & Rasinski, 2004). Such interactive conceptualizations insist that skills such as fluency and comprehension be developed simultaneously so that the reciprocal relationship between them becomes obvious to readers and can be incorporated into their internal monitoring system (Applegate et al., 2009).

Given these interactive factors, it is safe to say that fluency instruction alone is not enough to support increased comprehension for struggling secondary readers. A study by Allinder and colleagues (2001) indicated that increased reading rate and accuracy did not result in improved comprehension. Kuhn and Stahl (2003) also indicated that improving fluency alone does not always foster better comprehension ability. Nevertheless, while the ability to comprehend is due to a number of factors in addition to fluency for many struggling adolescent readers, fluency instruction may still prove beneficial (Rasinski et al., 2005; Roberts et al., 2008).

Reading Fluency and Struggling Adolescent Readers

One of the most common manifestations of reading problems in adolescents is the inability to read fluently (Archer et al., 2003; Dudley, 2005; Rasinski & Padak, 2005). When fluent readers read silently, they recognize words automatically. When older students fail to gain rapid and accurate decoding skills by the third or fourth grade, they not only struggle with reading comprehension, but they also fall behind their average reading peers in academic performance and achievement, rarely catching up (Archer et al., 2003; Dudley, 2005). When presented with academic tasks that require reading, these students often experience higher levels of frustration and anxiety, and lack the motivation, desire, and patience to participate in reading activities (Rasinski, 2000,

2006b). In addition to forming negative attitudes and behaviors toward reading activities, dysfluent adolescent readers experience other consequences including less reading practice leading to a reduction in vocabulary growth and background knowledge and fewer opportunities to develop and practice reading comprehension strategies and schema for understanding the various reading genres (Dudley, 2005; Moats, 2001; Rasinski, 2006b). Indeed, struggling adolescent readers read as few as 10,000 words per year, whereas average readers may read 10 times or even 100 to 500 times this number of words (Dudley, 2005). As a result, average readers continue to increase their background knowledge, vocabulary, and academic skills, whereas poor readers fall further and further behind. Stanovich (1986) referred to this phenomenon as the "Matthew Effect," where "the rich get richer, and the poor get poorer' making dysfluent readers ill-prepared for the academic challenges they will face in school and beyond their high school years. They frequently experience an array of performance, adjustment, and interpersonal problems, and also often earn lower incomes and experience underemployment at a disproportionately higher rate than their average reading peers (Dudley, 2005).

Among students who struggle with reading or have reading disabilities, Spear-Swerling (2006) identified two patterns of difficulties that are especially common. In the first pattern, students have difficulty decoding words accurately and read passages in a slow, labored fashion. Taking into account students at the secondary level, Archer and her colleagues (2003) further categorized those poor decoders into two distinct groups of struggling readers. The first and smaller group of students read at or below the second grade level and have not mastered beginning reading skills including phonemic

awareness skills, letter-sound associations, reading of decodable words, recognition of high frequency words (both regular and irregular), and reading of decodable text. The second, larger group of struggling secondary readers read between the 2.5 and 5.0 grade levels. These students are able to recognize some high frequency irregular words, but falter when faced with multisyllabic words, as they have no systematic approach for attacking or decoding these words, much less the confidence that would support multiple attempts at decoding a difficult unknown word.

In the second pattern identified by Spear-Swerling (2006), students may have achieved reasonably accurate word decoding, especially after remediation in phonemic awareness and phonics, but still read very slowly relative to other students their age. Reading deficits in content areas at the secondary level are frequently characterized by slow but accurate decoding (i.e., fluency deficits) that impedes comprehension (Valleley & Shriver, 2003). As children progress through school, they are expected to read larger amounts of text within a shorter amount of time. Slow, halting reading has an impact on how much information they can gain and grasp, and may even lead to exhaustion (Valleley & Shriver, 2003).

Fluency deficits in adolescents with reading disabilities may be linked to other underlying factors (Spear-Swerling, 2006). One especially important factor involves a cumulative lack of exposure to printed words. Struggling readers receive much less exposure to words (e.g., through independent reading both in and out of school) than do skilled readers. If struggling readers' difficulties are not remediated early, this cumulative deficit in exposure to words may be extremely difficult to overcome. In

addition, some investigators have linked problems in developing reading fluency to underlying deficits in processing speed, or the speed with which children can retrieve the names of familiar items, such as letters or numbers (Fuchs et al., 2001; Wolf, Bowers, & Biddle, 2000). Other researchers view these difficulties as reflecting a single underlying phonological deficit, the core deficit in most individuals with reading disabilities (Kuhn & Stahl, 2003).

Fluency is a critical element for many older students with reading disabilities because they consistently struggle with this reading component (Archer et al., 2003; Torgesen et al., 2001). For secondary students, not being able to read fluently makes it difficult to keep up with content and class demands (Rasinski & Padak, 2005; Swanson & Hoskyn, 2001; Woodruff et al., 2002). As a result, reading fluency instruction for adolescent struggling readers has received considerable attention in research literature, state performance standards, and reading curricula throughout the country (Dudley, 2005). Previous reports of effective fluency interventions (Chard et al., 2002; Katzir et al., 2006; Kuhn & Stahl, 2003; Meyer & Felton, 1999; NRP, 2000; Therrien, 2004; Wolf & Katzir-Cohen, 2001) have identified and synthesized fluency studies for struggling readers primarily at the elementary level. However, practices for teaching older students (grades six and above) who struggle with reading fluency has been less systematically studied and reviewed (Biancarosa & Snow, 2004; Chard et al., 2009).

Defining Reading Fluency

Even with the heightened interest in reading fluency and the importance of fluency instruction gaining momentum, there remains no single agreed-upon definition

(Rasinski, 2000). There are debates over the levels of reading components that underlie fluency, the levels of subskills that are needed for a reader to gain reading fluency, and how poor fluency affects other aspects of reading (Vaughan et al., 2003; Wolf & Katzir-Cohen, 2001). According to Kame'enui and Simmons (2001), fluency is eonomine; that is, it is a term so expansive and unsatisfactory in meaning that little understanding is gained beyond the use of the term. They point out that it is simple to recognize dysfluent reading in a child; however, the theoretical underpinnings and precise meaning of fluent reading are not always as apparent.

Many reading disability researchers (e.g. Mastropieri, Leinart, & Scruggs, 1999; Meyer & Felton, 1999; Samuels & Farstrup, 2006; Torgesen, Wagner, & Rashotte, 1997) based their definitions of reading fluency on some aspect of either LaBerge and Samuel's (1974) information processing model or Perfetti's (1985) verbal efficiency theory. Offering a pragmatic definition, Archer and her colleagues (2003) defined it as rate plus accuracy because it allows for "ease in measurement and intervention" (p. 96). Others framed oral reading fluency from a behaviorist perspective asserting that fluency can be improved through the practice of reading connected text (Chard, Vaughn, & Tyler, 2002; Fuchs et al., 2001; Therrien, 2004; Torgesen et al., 2001). Using this pretext, oral reading fluency is defined as "the oral translation of text with speed and accuracy" (Fuchs et al., 2001, p. 239) and is a time-related, performance indicator that measures phonological segmentation and recoding skills, rapid word recognition, and comprehension.

Kuhn and Stahl (2003) surveyed the range of definitions for fluency and proposed the following: "Fluency is accurate, rapid, and expressive rendering of text" (p. 5).

However, it has been argued that fluency refers to automaticity in all processes used while reading (Wolf & Katzir-Cohen, 2001). Meyer and Felton (1999) emphasized the importance of rate and implied the need for accuracy when they described reading fluency as "the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading such as decoding" (p. 284). Like LaBerge and Samuels' (1974) theory of automaticity, these definitions assume the reader must be able to perform basic reading subskills (e.g. accurate recognition of letters, words, semantic phrases) rapidly and with ease in order to reserve and allocate adequate cognitive resources to construct meaning from the words.

The definition reported by the NRP (2000) takes into account the components of rapid and automatic word recognition and of prosody. According to the panel, fluency is "the ability to read text quickly, accurately, and with proper expression" (p. 5). The panel also suggested that fluency extends beyond indicators of accurate word recognition and that it is a direct determinant of higher order skills such as reading comprehension. Hudson, Mercer, & Lane (2000) and Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl (2004) included prosody in their definition. They emphasized that readers not only be accurate and rapid, but also be able to apply prosodic understanding and demonstrate comprehension of text. Expanding the NRP's definition, Armbruster et al. (2001) explained that:

> Fluency is the ability to read a text accurately and quickly. When fluent readers read silently, they recognize words automatically. They group words quickly in ways that help them gain meaning from what they read. Fluent readers read aloud

> effortlessly and with expression. Their reading sounds natural, as if they are speaking. (p. 22)

However, Pikulski and Chard (2005) argued that NRP's definition omits a key factor in reading: comprehension. They indicated that a comprehensive definition should relate the centrality of fluency to comprehension and its established dimension. They proposed the following definition:

> Reading fluency refers to efficient, effective word-recognition skills that permit a reader to construct the meaning of text. Fluency is manifested in accurate, rapid, expressive oral reading and is applied during, and makes possible, silent-reading comprehension. (p. 510)

The emphasis on including comprehension's role when defining fluency is addressed by other researchers as well. In *The Literacy Dictionary: The Vocabulary of Reading and Writing,* Harris and Hodges (1995) define fluency as "freedom from word identification problems that might hinder comprehension" (p. 85). Samuels (2002), who established research and theory in reading fluency, cites the adoption of an expanded definition of fluency as a "major force in elevating its importance in the field of reading" (Pikulski, 2006, p. 72). He states, "To experience good reading comprehension, the reader must be able to identify words quickly and easily" (Samuels, 2002, p. 167).

Rasinksi, Blachowicz, and Lems (2006) emphasized three components of reading fluency: prosody, automaticity, and comprehension. They noted that others define reading fluency as merely automaticity—quick and accurate decoding. Samuels and Farstrup (2006) suggested that fluency is the ability to both decode rapidly or

automatically and comprehend simultaneously. In a similar vein, Topping (2006) suggested that fluency is an adaptive, context-dependent process that can operate at a number of layers or levels, whereby maximum meaning is extracted at maximum speed. For others, reading fluency is primarily comprehension or understanding, that comes as a result of reading with appropriate expressiveness, decoding speed, and accuracy (Pressley et al., 2006; Pikulski, 2006; Torgesen & Hudson, 2006).

Torgesen et al. (2001) explained that after reviewing a wide range of definitions, researchers should select a definition that has meaning and implication for the area being examined. For purposes of this review, reading fluency is comprised of word recognition accuracy, automatic word recognition, passage reading rate (speed), and prosody in oral passage reading. A more complete explanation of each of these aspects of reading fluency follows. A later section on the theoretical framework of reading fluency will provide further elaboration on the relationship between fluency as defined here, and reading comprehension—a matter of considerable importance to this review.

Word Recognition Accuracy

Automatic behavior of any type occurs without having to be directed by conscious thought. The kind of automatic behavior that is part of fluent reading is no exception. The processing of words in print, the accessing of the correct meaning and pronunciation from the reader's oral vocabulary, and the transfer of that information to working memory all take place without the conscious direction of the reader (Samuels & Farstrup, 2006). The idea of accuracy in word recognition focuses on correctly identifying words on the first attempt. Word recognition accuracy refers to the ability to recognize and

decode words correctly (Samuels & Farstrup, 2006). When a word is identified correctly, the meaning retrieved from the reader's oral vocabulary is one that makes sense with the other words in the sentence. Beginning readers read words initially through mastery of the alphabetic principle and working knowledge of phonemic awareness, particularly blending and segmenting (Rasinski, 2004). The ability to use these skills in a continuous manner that is free from errors constitutes accuracy at its base level. Word recognition accuracy is the development of letter-sound skills to enhance a reader's capacity to recognize familiar and unfamiliar words by directing his/her attention to component letters as he/she maps sounds (Ehri, 1995; LaBerge & Samuels, 1974). Word recognition accuracy is a prerequisite skill for automatic word recognition and its mastery enables the reader to become increasingly familiar with letters and words (Kuhn & Stahl, 2003; Rasinski, 2004).

Automatic Word Recognition

Automatic word recognition (automaticity) is defined as quick, accurate, and effortless word recognition at the single word level (Klauda & Guthrie, 2008; Rasinski et al., 2006; Samuels & Farstrup, 2006). How automatically readers can identify the words in a passage plays a major role in how fluently they read. The size of a reader's sight word vocabulary, or the proportion of words in a passage that can be recognized by sight, also plays a key role in how quickly and accurately a reader is, especially for students who have below average reading rates (Hudson et al., 2009). The rate and precision at which single words are known is an important predictor of comprehension. As word recognition accuracy develops, children begin recognizing larger and larger numbers of

words resulting in them recognizing words without having to sound them out or guessing at their identity from contextual clues (Ehri, 1995). Well-practiced words are recognized automatically, which implies that recognition occurs quickly and with little cognitive effort (Kuhn & Stahl, 2003; LaBerge & Samuels, 1974). The automaticity with which a reader can recognize words is as important as word-reading accuracy (Samuels & Farstrup, 2006).

Passage Reading Rate

Passage reading rate is defined as the speed at which accurate oral passage reading takes place (Richards, 2000; Samuels & Farstrup, 2006). Most studies that have examined reading rate quantify it in terms the number of words read correctly per minute (Fuchs & Deno, 1981; Rasinski, 2000; Richards, 2000; Samuels & Farstrup, 2006). Competent readers are also able to adjust their reading rate, depending on the context and content of the given reading selection. Dwyer (2004) states that fluent readers select and maintain appropriate rates and speed during oral reading. He further states that reading rates can change based on the situation or meaning found within the passage. Students who possess good reading fluency skills speed up or slow down their oral reading rates to create the appropriate emphasis on the meaning of the text.

Prosody

It is not enough to look at fluency in terms of word recognition accuracy, automatic word recognition, and passage reading rate. It is also important to look at prosody. Prosody is a compilation of spoken language features that includes stress or emphasis, pitch variations, intonation, reading rate, and pausing (Dowhower, 1991;

Samuels & Farstrup, 2006; Schwanenflugel, Hamilton, Kuhn, Wisenbaker, & Stahl, 2004). In other words, it is a reader's ability to both understand and apply proper phrasing when reading. Prosodic reading reflects an understanding of meaningful phrasing and syntax—the ways words are organized in sentences and passages (Rasinski, 2004). It also reflects the reading cues provided by text features such as punctuation marks and headings (Osborn, Lehr, & Hiebert, 2003). These elements indicate question, surprise, exclamation, and other meanings beyond the semantics of the words being spoken. Fluent readers understand that punctuation marks can tell them where and how long to pause and what kind of intonation to use when reading a sentence. They also understand that text features, such as words in boldface or all capitals, can tell them where to place emphasis. Readers then use this information rapidly, and often without conscious attention, to construct meaning as they read. When these features are present, the reader is reading prosodically or "with expression." Struggling readers are often characterized as reading in monotone without expression or with inappropriate phrasing. Prosodic reading is an indication that the reader is actively constructing the meaning of the passage as the words are being identified and pronounced. As a result, prosodic reading serves as an aid to comprehension (Torgesen & Hudson, 2006).

It is clear from this discussion that reading fluency is indeed a multidimensional construct – one dimension stresses the importance of accuracy in word decoding, the second focuses on quick and automatic recognition of words, a third dimension emphasizes the speed at which passage reading takes place, while the fourth stresses expressive and meaningful interpretation of text (Hudson et al, 2009: Rasinski, 2004).

These dimensions are interrelated. Indeed, accurate and automatic reading at appropriate rates creates the conditions for expressive reading. Most important, reading fluency serves as a bridge between the two major components of reading – word decoding and comprehension (Pikulski & Chard, 2005). At one end, fluency connects to accuracy and automaticity in decoding. At the other end, fluency connects to comprehension though prosody, or expressive interpretation. Combined, all components contribute to being a competent reader reminding us that reading fluency is a "complex, multifaceted construct" (Hudson et al., 2009, p. 5).

Historical Foundation of Reading Fluency

Early Conceptualizations of Reading Fluency

A look at the history of research on oral reading fluency revealed how complicated and how important it is for a child's reading development. One of the first researchers who contributed to our understanding of fluency was William Cattell, a nineteenth-century psychologist who discovered that readers could read a word faster than they could name a picture (Rasinski, 2006a; Wolf & Katzir-Cohen, 2001). Cattell was the first to emphasize that humans become almost "automatic" when they read, much more so than when speaking. He explained that reading fluency represented a unique capacity that humans have to learn something so well that they can do it almost without thinking. Edmund Huey also contributed to our awareness of reading development and reading fluency (Rasinski, 2006a; Wolf & Katzir-Cohen, 2001) by describing automaticity in reading. In his book, *The Psychology and Pedagogy of Reading,* he described how reading fluency developed. According to Huey, when readers initially

encounter a word, they have to pay close attention to it. However, he also noted that as the same word is repeatedly encountered, each repetition frees the mind from attention to detail, which reduces the amount of time mind has to focus on the process of reading (Rasinski, 2006a).

The Beginnings of Oral Reading

From the earliest days of American history through the first decade of the twentieth century, oral reading dominated school instruction and was part of reading instruction since colonial times (Rasinski et al., 2006; Rasinski, 2003, 2006a). In early schooling, oral reading was considered a legitimate outcome for instruction. The development of "eloquent oral reading" was considered a goal for classroom instruction because of its prominence in people's daily lives for entertainment and sharing information (Rasinski et al., 2006). Before books were mass-produced, most households and schools had only limited copies (Rasinski, 2003, 2006a). Since books were scarce and usually only one person in a household could read, sharing the contents of available books took the form of oral reading. Being that the need in society was for oral reading, it quickly found its place in schools of the time.

Schools in the nineteenth century began to use a form of oral recitation that focused on elocution, or correct pronunciation, as the preferred method and goal of reading instruction (Rasinski et al., 2006; Rasinski, 2003, 2006a). Many of the reading series of the nineteenth century included sections on elocutionary principles and some included printed cues as to appropriate intonation and emphasis (Rasinski, 2003, 2006a). Lessons involved the teacher reading a text orally followed by the students practicing the

text orally on their own with the teacher providing assistance and evaluation of the individual student's reading. This approach became formalized at the beginning of the twentieth century into what was called the "story method" of instruction, since the focal unit of instruction was an entire text or fully-contained passage (Rasinski et al., 2006; Rasinski, 2003, 2006a). By the latter half of the nineteenth century, oral reading had become a necessary part of American education.

The Emergence of Silent Reading

At the beginning of the twentieth century, oral reading as the primary mode of reading instruction was being challenged. As reading material became more easily accessible and schools promoted literacy across a broader spectrum of American society, the need to impart information orally declined, resulting in individual silent reading becoming a more common feature of family and community life (Rasinski et al., 2006). European and American scholars began to question oral reading's role in American classrooms and argued that oral reading instruction gave too much priority to elocutionary matters such as pronunciation, emphasis, inflection, and force over understanding (Rasinski, 2003, 2006a). For example, Horace Mann asserted that reading instruction became an "action of the organs of speech" rather than an "exercise of the mind in thinking and feeling" and that "more than eleven-twelfths of all the children in reading classes do not understand the meaning for the words they read" (as cited in Rasinski, 2003, p. 13). He felt that oral reading placed too much emphasis on the mechanical and oral aspects of reading.

Researchers such as Huey (Wolf & Katzir-Cohen, 2001; Rasinski, 2003), agreed that oral reading had become an activity found only in schools because in everyday life, silent reading was mostly used. Therefore, it was felt that in order for teachers to take advantage of a growing body of print available to adults and children, teachers needed to emphasize silent reading since it was now considered more efficient than oral reading. Pedagogically, silent reading was easier to plan for teachers with limited training in instructional strategies. The continued criticism of the practice combined with more literature for which to read and pedagogical pressures to leave "oral" out of reading instruction, effectively resulted in researchers paying less attention to it and took it out of the hands of practitioners. Rasinski (2006a) states, "Early in this country's history, oral reading for elocution (i.e. reading fluency) was a focal point of instruction. However, by the later part of the 20th century, oral reading fluency was relegated, at best, to secondary status in reading instruction" (p. 10). During this time, comprehension of text became more important to instruction than the oral interpretation of text. Silent reading, with its focus on comprehension, replaced oral reading as the preferred mode of reading instruction largely because scholars felt that silent reading was a more authentic form of reading since it was becoming more common than oral reading (Rasinski, 2003; Rasinski et al., 2006; Samuels & Farstrup, 2006). Silent reading focused readers' attention on grasping meaning—the ultimate goal of reading—while oral reading focused on accurate recitation of the text. Therefore, by the 1920s, silent reading was well established in American schools.

Even though oral reading as a goal for reading instruction in the twentieth century was diminishing, it continued to be an important foundation for reading instruction. Oral reading approaches, such as round-robin reading (unrehearsed sight reading, with turn-taking) persisted throughout the latter half of the twentieth century as the primary method of reading instruction (Rasinski, 2006a). Oral reading was used primarily as a method of checking students' word recognition after silent reading. This change in the use of oral reading from reading for fluent expression to reading for checking word recognition assumed a preeminent role in reading instruction from the early 1950s to today.

The Reemergence of Oral Reading Fluency and Its Importance

Studies conducted by various researchers from the 1970s to 1980s demonstrated a relationship between reading fluency and reading achievement, including comprehension (Chomsky, 1976; LaBerge & Samuels, 1974; Rasinski, 1989; Samuels, 1979; Stanovich, 1980). However, interest in reading fluency subsided as the phonics/whole language debate took center stage in the 1980's and 1990's, only to be renewed once again when the NRP Report (2000) made fluency instruction one of the five central foci of their research review. Reading fluency has been a popular topic ever since, resulting in a new round of research on its importance including the development and validation of strategies to increase it. Research began to demonstrate a relationship between reading fluency and other measures of reading achievement and proficiency including comprehension (NRP, 2000; Rasinski, 2006a). Scholars began realizing that "oral, expressive and automatic readings of texts were significant contributors to overall proficiency in reading" (Rasinski, 2006a, p. 15). As a result, researchers proposed

theories about the conceptualization of oral reading fluency, its development, and its contribution to reading instruction.

Theoretical Basis for Reading Fluency

There are several widely accepted theories about the development of reading fluency and its importance for reading comprehension including automatic information processing theories developed by LaBerge and Samuels (1974), Perfetti's verbal efficiency theory (Wolf & Katzir-Cohen, 2001), the interactive-compensatory model of fluency development proposed by Stanovich (1980), the stages of reading development proposed by Ehri (1995) and Chall (1996), the influence of prosody (Schreiber, 1980), and eye movement in fluent reading (Hyönä & Niemi, 1990; Schnitzer & Kowler, 2005; Taylor, 2006).

Automatic Information Processing Theory

Early understanding of what is involved in reading fluency development was shaped by LaBerge and Samuels' (1974) theory of automatic information processing or theory of automaticity, which is the most widely known and accepted explanation of reading fluency. According to this cognitively based theory, the reading process is viewed as a complex network of subskills. This theory emphasizes the importance of high-speed word recognition. According to LaBerge and Samuels, the execution of a complex skill (such as reading) requires the coordination of component processes within a short time. If each component requires attention, execution of the skill will be impossible since attentional capacity will be exceeded. However, if some components can be executed automatically, there will be enough attentional capacity left for the skill

to be performed successfully. This conceptualization emphasizes automaticity as an explanatory construct in developmental reading ability. The theory rests on the following assumptions. First, individuals have limited amount of attention or processing energy available for decoding and comprehending text at any given time during reading. Second, comprehension requires a great deal of attention. Third, automatic decoding does not require a lot of attention. Fourth, to develop good reading comprehension skills, a reader needs to minimize the amount of attention used for decoding and maximize the amount of attention available for comprehension.

According to information processing theories, readers have two essential and simultaneous tasks to perform—recognizing words and deriving meaning (i.e., comprehending). When a passage contains too many words that are difficult either because they are unfamiliar or difficult to decode, readers tend to focus more attention on decoding these words. Consequently, little attention remains for comprehension. In contrast, when readers can recognize printed words automatically, word identification requires little attention and readers may focus on comprehension. In essence, LaBerge and Samuels promoted the view that skilled reading involves the reallotment of attentional capacity from lower-level word identification processes to resource-demanding comprehension functions. They propose that to be an efficient reader, a student should be able to recognize and identify words instantly and then connect the words as they read to make meaning.

Verbal Efficiency Theory

Perfetti's verbal efficiency theory (Wolf & Katzir-Cohen, 2001) represents another influential perspective in fluency-related research because it accounts for the effects of slow word recognition on reading comprehension. Like LaBerge and Samuels (1974), Perfetti worked within an information-processing approach. Perfetti referred to fluency as "effective reading speed" that he defined as the outcome of comprehension accuracy and reading speed (words per minute). Perfetti hypothesized that individual differences in reading comprehension were produced by individual differences in the efficiency of local processes through which temporary representations of text are established. Some of the critical components in Perfetti's model that contributed to the efficiency of local processes were (a) general symbol activation and retrieval, (b) recognition processes, (c) lexical access and retrieval, and (d) working memory (Wolf & Katzir-Cohen, 2001). Perfetti stressed that the quality of representations and of each of the local processes, components, and their various forms of integration (depending on the type of reading task) were potentially rate-limiting factors in reading acquisition. Equally important, Perfetti posited that learning and practice played a pivotal role in the development of proficiency in these local processes. Though Perfetti never referred to fluency directly, he emphasized the impact or cost on a reader's ability to comprehend a text if the reader failed to develop critical, lower-level components, processes and their integration. Automatic information processing theories are important because they validated the contribution of reading fluency to comprehension and emphasized that fluency could be taught, and by doing so, comprehension could be improved.

Interactive-Compensatory Model of Reading Fluency

Stanovich (1980) added a compensatory component to the general interactive model to explain individual differences in the development of reading fluency. According to him, word identification should be so rapid and fluent that the reader can devote full attention to the message of the text, allowing phonological, orthographic, semantic, and syntactic information to reinforce each other to improve the overall efficiency of the reading comprehension system. However, when a reader is unable to rapidly identify words in passages of text, the reader must then examine each word and use orthographic, phonological, semantic, and syntactic information to attain the basic word identification. As the reader shifts cognitive resources to examine these sources of information for basic word identification, the reader has insufficient cognitive resources available for comprehension.

Stanovich (1980) proposed that context-free word recognition (e.g. lists) at the word and subword level provided important information on individual differences in reading fluency. He described three distinct abilities related to context-free word recognition: (a) the ability to recognize words automatically, which allows mental processing to focus on higher-level skills (comprehension); (b) the rate at which words are recognized and coded into short-term memory, which aids the integrative comprehension processes that helps activate the information that is already there; and (c) phonological abilities, which aids word reading by providing a predictable pathway for letters to be accessed and by providing a predictable code for information held in short-term memory.

Stage Models of Reading Development and Fluency

Some researchers view fluency as a developmental stage in reading acquisition. Stage models assume that reading is qualitatively different at different stages of development (Stahl & Heubach, 2005). A child at one stage of development will have different skills, knowledge, and beliefs about reading than a child at a higher or a lower stage. At each stage, the knowledge and skills needed for the next stage are developed. Fluency has also been explained as developing in stages. Ehri (1995) proposed that automatically reading words by sight is the key to skilled reading of text because it allows readers to process words in text quickly, without attention directed to the word itself. Her theory described how readers systematically progress in stages to achieve fluency. Pikulski (2006) stated that Ehri's developmental stages served as a guide to understanding the behaviors of students as fluency develops, and, as a result, have led to the provision of interventions that facilitate that development.

Ehri (1995) suggested that words become sight words through a thorough analysis of the word's orthographic structure. The resulting mental representations enable a reader to identify words quickly and automatically. The identification process includes accessing information about the word's spelling, pronunciation, and meaning. However, the establishment of a complete representation does not occur immediately. Instead, Ehri proposed that such a full depiction occurs in four distinct phases: prealphabetic, partial alphabetic, full alphabetic, and consolidated alphabetic.

The prealphabetic phase occurs when letter-sound knowledge is not used to read words. Pre-alphabetic readers have no ability to decode words or to analogize. They

handle the task of reading words by memorizing their visual features or by guessing words from their context (Ehri, 1995). During the second phase, partial alphabetic recognition, students know at least some letters of the alphabet, usually their names, and can use them to remember how to read words by sight using partial-alphabetic cues. They can guess words using context and partial letter cues. Students at the partial alphabetic stage lack the ability to decode words and read words by analogy, because both of these strategies require more working knowledge of the alphabetic system than they possess. As students continue to develop an understanding of the alphabetic system, they move toward full alphabetic coding. At this point, readers possess extensive working knowledge of the graphophonemic system and they can use this knowledge to analyze fully the connections between graphemes and phonemes in words. They can decode unfamiliar words and store fully analyzed sight words in memory. For most students, the full-alphabetic phase requires systematic phonemic awareness and phonics instruction to establish the foundation for attaining mature word reading skill (Ehri, 1995; Kuhn & Stahl, 2003). Students with reading disabilities tend to have trouble and remain in the first three phrases of development, never reaching a level of proficiency where they can read a large number or words automatically or with fluency.

During the final consolidated alphabetic phase, students consolidate their knowledge of grapheme-phoneme blends into larger units that recur in different words. This phase has also been called the orthographic phase to indicate that the focus is on spelling patterns. Word learning becomes more mature. Readers acquire a working knowledge of grapheme word patterns and demonstrate this knowledge by reading real

words they have never read before which contain these patterns. This phase actually begins in the full-alphabetic phase (Ehri, 1995). When readers reach this automatic phase, they can identify familiar and unfamiliar words quickly, and have well-developed strategies for identifying words, thus freeing his/her attention to focus on meaning. Unfortunately, many adolescents with reading disabilities do not progress into the consolidated phases of reading (Ehri & McCormick, 1998). Instead, they remain in the partial- and/or full-alphabetic phases.

Several other features of Ehri's stage theory are also of note. First, she de-emphasizes the role of context in word recognition, instead stressing the graphic capabilities of letter familiarity, phonemic awareness, and knowledge of how grapheme typically represents phonemes in words. Her theory also stresses that reading words is dependent on becoming familiar with their oral forms (Pikulksi & Chard, 2005). Ehri's theory requires that students are familiar with the syntax or grammatical function of the words they are reading and with the meaning of those words. Further, if the syntactic and meaning aspects of words are to be activated, they must be part of what the reader knows through oral language development.

Ehri's description of the stages of word recognition explains how readers recognize words by sight by carefully processing print. Her theory brings coherence to much of the research on fluency because it offers a framework for instruction designed to promote and improve fluency. Understanding her developmental stages can serve as a valuable guide to understanding the behaviors of students as they approach the development of fluency.

Chall (Chall, 1996; Kuhn & Stahl, 2003) describes six stages of learning to read that help further clarify the key role of fluency in the reading process and explains how fluency develops over time. Her approach is global, encompassing the development of decoding, comprehension, and critical evaluation. Because it is global, Chall's model describes broad trends in children's development as fluent readers (Kuhn & Stahl, 2003). The first stage addresses the prereading stage of literacy such as the development of print concepts or phonemic awareness, which corresponds to Ehri's prealphabetic phase. This period encompasses the literacy behaviors that are developed prior to formal instruction where the learner develops a foundation that will allow later instruction to proceed in a meaningful manner. The second stage addresses the beginning of formal instruction such as the development of the alphabetic principle, the initial stage of conventional literacy or the beginning of formal reading instruction. This stage parallels the full alphabetic coding phase in Ehri's model. At this stage, the instructional emphasis is on developing learners' recognition of basic sound-symbol correspondences while providing them with sufficient opportunity to establish their decoding ability. It is during the third stage of the reading process (referred to as confirmation and fluency, or the ungluing from print stage) when students develop reading fluency. This corresponds to Ehri's consolidated alphabetic phase. During this third stage, students have established their decoding ability, are reading with automaticity, and making use of the prosodic features in language such as appropriate stress and intonation in their reading. After mastering the "ungluing from print" stage, students are capable of reading fluently and can then make

the shift from learning to read to reading to learn and develop the skills needed to interact with expository text and complex vocabulary as they move through the final stages.

Prosody in Fluent Reading

For decades, educators have regarded "reading with expression" a necessary and defining feature of skilled fluent reading (Dowhower, 1991). One key task of fluent reading is to interpret the prosodic features in a text. Schreiber (1980) theorized that reading fluency difficulties stem from the absence of prosodic cues in written language. Schreiber suggested that fluent readers use cues (i.e., morphemic, syntactic, semantic, and pragmatic) present in text to organize it into meaningful phrases and read with correct prosody and understanding. He contended that some readers have difficulty transferring from oral language, where prosodic markings are explicit, to written language, where prosodic markings need to be inferred. Readers who fail to generate appropriate prosodic markings do not divide sentences into meaningful phrases and therefore have difficulty comprehending written text, regardless of their ability to decode individual words or read connected text at a reasonable rate. These students are not able to recognize prosodic features that mark the boundaries between syntactic phrases and are often unable to recognize other kinds of signals (e.g. function words, inflectional endings, and other morphological signals) that would result in fluent reading (Schreiber, 1980).

Because prosody and reading comprehension are mutually related, Schreiber posited that prosody should be an important focus of fluency instruction. However, Osborn et al. (2003) stated that the relationship of prosody to reading success has not been clearly established. Dowhower (1991) expressed that the relationship between

prosody and comprehension is much like the "chicken-or-the-egg" dilemma. Researchers are not sure which comes first; or if one is necessarily an indicator of the other. Nevertheless, just as prosodic features help children understand and interpret spoken language, they may also help children get meaning from text (Schreiber, 1980).

Reading Fluency and Eye Movement

Fluent reading requires a certain speed when performing it, which implies that the terms fluency and speed are closely related. Fluent readers should be able to recognize words automatically and use strategies to decode words quickly. Studies of the way the eyes move during reading suggest that fluent reading is not the same as skimming or scanning a text, where a reader ignores or skips over words and sentences (NRP, 2000). The development of fluent reading involves learning to look at each word more quickly or efficiently.

While research on reading fluency has focused mainly on decoding and comprehension, eye movement may also affect how automatically text is read. According to eye movement theorists, the act of reading is a complex visual and cognitive task that requires integrating specific receiving, processing, and memory skills (Rayner, 1998; Rayner, Ashby, & Pollatsek, 2004). Poor integration of these skills may negatively affect reading fluency and comprehension. To read fluently, students must keep their eyes focused on the line they are reading and filter out distractions on the page. This controlled visibility enhances reading concentration and helps readers to track the text and read more effectively (Hyönä & Niemi, 1990; Rayner, 1998; Rayner, Liversedge, White, & Vergilino-Perez, 2003; Schnitzer & Kowler, 2005).

Eye movement theorists also posit that while reading, people make a series of eye movements (called saccades) separated by fixations (Rayner, 1998; Rayner et al., 2003, 2004). It is during these eye fixations that new information is acquired by the processing system and the mental representation of what the text means is constructed. Eye movements are critical because they mediate the sequence of cognitive processes that are involved in first extracting the required visual information from the text and secondly, the interpretation of that information (Ashby, 2006; Rayner et al., 2003, 2004). Smooth eye movement is essential for becoming a successful reader.

Three aspects of saccades are of interest: (a) the number of fixations—or stops—the eye makes while recognizing words, (b) the duration of the eye fixation or the amount of time it takes a reader to identify and understand a segment of text before moving on, and (c) the number of times the eye regresses, or goes back to a previously encountered portion of text (Paulson, 2005). When automaticity has been achieved on a passage, fixations are few, the duration of fixations is short, and there are few regressions. "Skilled readers learn to develop a broader perceptual span or word identification span during reading that allows them to take in more information about words in a single fixation" (NRP, 2000). The eye movements of poor readers or those with reading disabilities reveal their lack of fluency. They move backwards or skip words more often than good readers (NRP, 2000). Rayner (1998) summarized the differences in eye movements between good and poor readers as follows: "fast readers make shorter fixations, longer saccades, and fewer regressions than slow readers" (p. 392).

Although research on eye movement reveals an obvious connection with automaticity, a conundrum exists concerning their relationship. As with prosody, researchers are unclear as to which comes first—appropriate eye movement, or automaticity in reading (Ashby, 2006; Paulson, 2005). Therefore, it is unclear whether interventions should focus on changing eye movement, reading fluency, or both. There is some preliminary research indicating that the use of computer-based systems and ocular devices may have a positive impact on reading fluency by providing additional reading practice and analyzing and measuring eye movements and fixations (Harris & Patrick, 2002; MacKeben et al., 2004; Rayner et al., 2004; Reynolds, Nicolson, & Hambly, 2003; Søvik, Arntzen, & Samuelstuen, 2000; Taylor, 2006), but their findings are in need of replication and extension. One such device is The Visagraph Eye Movement Recording System, an ocular device used for recording and evaluating reading fluency. It consists of a pair of goggles fitted with infrared sensors that record the eye-movements of the reader as they read a text. It measures a student's silent reading fluency skill and/or detects visual/functional difficulties. Eye-movement characteristics are automatically analyzed and detailed reports that provide insight as to how the individual reads are generated (Taylor, 2006).

The theories presented in the section just concluded provide the framework for hypothesizing that oral reading fluency serves as an important indicator and prerequisite skill for reading competence which includes the reader's capacity to process meaningful connections within and between sentences, to relate text meaning by checking consistencies with prior information, and to make inferences to supply missing

information. A point of agreement among all of these theorists is that fluent reading is effortless, fast, unconscious, and automatic. In addition, acquiring fluency takes time and is achieved through careful instruction to first build accuracy and then practice and repetition in consistent environments to foster fluency. Most importantly, these theories suggest that fluency is an outcome of a set of learned skills and that there is a connection between being a fluent reader and being able to comprehend text.

Fluency Interventions for Struggling Adolescent Readers

Reading practice is believed to improve fluency. As a result, interventions that give students the opportunity to repeatedly practice reading have been widely practiced. Research has been conducted to determine the effects of repeated reading on reading rate, accuracy, and comprehension of emerging and intermediate readers; but, until recently, little research has been conducted with struggling adolescent readers (Devault & Joseph, 2004; Edmonds et al., 2009; Scammacca et al., 2007; Valleley & Shriver, 2003; Vandenberg, Boon, Fore, & Bender, 2008). Secondary students are faced with reading and understanding complex content at a rapid pace, creating great challenges for readers with and at risk for reading disabilities. Given the importance of reading fluency and its potential impact on comprehension, particularly for struggling adolescent readers, ensuring that they become proficient readers may be a teacher's most important task. Thus, there is a need for evidence-based instructional strategies for struggling adolescent readers that improve reading fluency. A synthesis of fluency studies that included interventions for struggling readers in grades 6-12 from 1980 to 2005 found only 19 studies, further revealing the scarcity of knowledge regarding effective practices to

increase struggling secondary school readers' ability to read fluently (Wexler, Vaughn, Edmonds, & Reutebuch, 2008). This synthesis identified various repeated reading fluency interventions proven effective for struggling readers at the secondary level. In the next section of this review, evidence-based strategies that build the reading fluency of struggling adolescent readers are discussed. The various interventions described here include variations of repeated reading (with and without a model, classwide peer tutoring), previewing, student choice, and duet reading.

Repeated Reading

The review of the fluency literature revealed that repeated reading represented the most widely studied method for developing reading fluency and has been proven an effective instructional tool to increase oral reading fluency among normally developing as well as struggling readers (Herman, 1985; Mastropieri, Scruggs, & Graetz, 2003; Meyer & Felton, 1999). The NRP (2000) endorsed repeated reading procedures in a variety of forms as having a positive impact on word recognition, fluency, and comprehension. Repeated reading's main steps are derived from its name—the repetitious reading of a selected passage. Originally developed by Samuels and Dahl (Meyer & Felton, 1999) as an attempt to translate LaBerge and Samuels' theory of automaticity into practice, repeated reading requires a student to read a selected passage at an appropriate instructional level aloud several times until a desired rate of reading, measured in words per minute, is achieved. The intervention was designed and intended to be used as "a supplement to any developmental reading program" (Samuels, 1997, p.

377). Repeated reading interventions are easy-to-implement and often take fewer than 10-15 minutes a day.

Samuels (1997) reasoned that like athletes and musicians who become proficient through constant repetition and practice of component skills, readers become proficient through repeated readings of individual texts. Each time they re-read a text, they are able to improve their speed and accuracy. Samuels noted that this development of fluency is transferable to other texts. He observed that the continued practice of decoding new passages resulted in progressively higher decoding frequencies during subsequent readings of text. Additionally, the number of repetitions required to meet the fluency criterion decreased when reading new passages.

In a meta-analysis of repeated reading studies, Therrien (2004) found that students with learning disabilities successfully generalized new fluency and comprehension gains to novel readings. Specifically, students with learning disabilities who had received repeated reading interventions made significant fluency gains and moderate comprehension gains on materials not previously read. However, in a more recent analysis of repeated reading studies for students with or at-risk for learning disabilities, Chard and his colleagues (2009) revealed that repeated reading was not supported by rigorous research standards, and, as a result, is not an evidence-based practice. However, despite their findings, they do not suggest that repeated reading practices be discontinued as a method for increasing reading fluency since the combination of theoretical support and positive effect sizes in meta-analyses suggest that "in the absence of innovations with

documented effectiveness in improving fluency, repeated reading practices should be continued" (Chard et al., 2009, p. 278).

Steps in Repeated Reading

Taken from the research literature, the typical steps or procedures for conducting a repeated reading session include the following: (a) the teacher determines if a student can read text, and if so, at what level they can it automatically, (b) the teacher gathers needed materials including the reading passage—teacher and student copy, forms for recording performance, and a timing device, (c) the teacher prompts the student to read the passage at the student's independent or instructional reading level, (d) as the student reads, the teacher records reading time (in seconds) and reading errors or miscues, (e) the student re-reads the passage a specified number of times or to a preset fluency criterion, and (f) the instructor and/or reader record the reading rate (words per minute) and errors of the first and final readings on a graph depicting growth, thus recording growth in performance between the initial and final readings (Chard et al., 2002; Kuhn & Stahl, 2003; Meyer & Felton, 1999; Therrien & Kubina, 2006). The procedure is then repeated with a new passage at a similar level.

Researchers have demonstrated that corrective feedback in the form of telling the student the correct pronunciation of a word and monitoring and sharing students' progress also appear to be a critical component of repeated reading as does cuing the student to read for fluency (telling them to read faster) and/or comprehension (Chard et al., 2002; Therrien, 2004). Overall, research studies reviewed have shown that repeated reading increases fluency, accuracy and, to a lesser degree, improves comprehension

(Chard et al., 2002; Kuhn & Stahl, 2003; Meyer & Felton, 1999; Therrien, 2004). Research also indicates that some variations of repeated reading appear to be more effective than others. Several studies have varied the procedure used for repeated readings from that first recommended by Samuels (1979, 1997). For the remainder of this section, studies involving variations of repeated reading involving struggling adolescent readers will be reviewed.

Variations of Repeated Reading

Repeated Reading with a Model. Reading with a model requires the adult or more proficient peer to read the passage aloud while the student listens. After listening to the model, the student repeatedly reads the passage. Additionally, modeling may also involve providing feedback for incorrect words (e.g. omissions, substitutions, insertions, mispronunciations). Seventeen studies examined the effects of repeated reading with some type of model or previewing procedure on adolescents. Findings are summarized by type of model (e.g., audiotape).

Audiotaped model. Four studies utilized an audiotaped model of good reading for students before reading isolated words or passages (Conte & Humphreys, 1989; Daly & Martens, 1994; Freeman & McLaughlin, 1984; Shapiro & McCurdy, 1989). Results revealed slight improvements in reading rate, but not in other reading tasks such as word recognition and comprehension. These studies showed that students who previewed words or passages by listening to a tape of good reading prior to rereading improved their reading rate on passages or word lists.

An audiotaped procedure for improving reading fluency was conducted by Freeman and McLaughlin (1984). High school students with learning disabilities were required to read aloud a list of words simultaneously with a tape recording of the word lists being read at a significantly higher reading rate, and then read them to a teacher. No teacher correction or modeling was provided, but correct words and error rates were recorded. After reading the words with the tape recorder, students were assessed on the same list. Results indicated an increase in correct oral response rates of isolated words and a decrease in each student's oral error rates.

In a study involving high school students identified with behavior disorders, Shapiro and McCurdy (1989) instructed their participants to read repeatedly along with an audiotaped recording of vocabulary words. For all the participants, there was an increase in words read correctly per minute from baseline to intervention. However, the students showed minimal generalization when required to read these same words in passages.

Conte and Humphreys (1989) also implemented repeated reading using audiotaped material in a study. Middle school students who struggled with reading listened to and read audiotaped stories until the passages could be read fluently without the tape. A same-aged control group with similar reading difficulties was given an alternative reading program that was similar to that received by the experimental group (with respect to creative writing, spelling, phonics, and vocabulary development), but was different in terms of passage reading exercises. The controls read from basal readers, whereas the experimental group did repeated readings of audiotaped materials. Unlike

the previous studies, these researchers specified a criterion that students had to read a passage without assistance of the audiotape and without hesitation at the same speed as the tape, with no oral reading errors. The students in the repeated reading audiotaped group showed a significant effect on oral reading, as compared to the control group. However, similar to Shapiro and McCurdy (1989), Conte and Humphreys' effects failed to generalize.

Two of the instructional interventions used by Daly and Martens (1994) involved their participants listening to audiotaped passages and word lists. They compared a taped model of passage reading with repeated reading without a model and with audiotaped reading of a related word list. On measures of passage reading accuracy and fluency, the taped reading model resulted in consistently better performance than repeated reading without a model and taped words. The taped words condition resulted in better performance on a measure of word reading accuracy for three of the four participants.

Across all these studies, students who used an audiotaped model of good reading improved their reading rate on future readings, but did not consistently improve their word attack or comprehension ability. These findings suggested that listening to audiotaped models of good reading may improve reading rate on the modeled passages or word lists, but this improvement may not generalize to unpracticed passages or to a broader range of reading tasks involving word recognition or comprehension. Most important, this finding reinforced the need to include unrehearsed reading passages as dependent variables in repeated reading research.

Live model. Thirteen studies utilized an adult or more proficient peer as a live model of good reading before or during reading while students engaged in repeated reading of isolated phonics elements, words, and/or passages (Alber-Morgan, Ramp, Anderson, & Martin, 2007; Devault & Joseph, 2004; Harris, Marchand-Martella, & Martella, 2000; Homan et al., 1993; Marchand-Martella, Martella, Orlob, & Ebey, 2000; Mercer et al., 2000; Rose & Beattie, 1986; Rose & Sherry, 1984; Scott & Shearer-Lingo, 2002; Skinner et al., 1993; Skinner, Cooper, & Cole, 1997; Strong, Wehby, Falk, & Lane, 2004; Wexler, Vaughn, Roberts, & Denton, 2010). The adult model of good reading used in these studies was the experimenter, the students' teacher, or some other instructor. Studies conducted by Mercer et al. (2000), Scott and Shearer-Lingo (2002), Devault and Joseph (2004), and Strong et al. (2004) used an adult reader to also provide corrective feedback during or prior to reading. The study by Fuchs, Fuchs, and Kazdan (1999) used a peer to provide corrective feedback if a student was stuck on a word during reading. The procedure was a hybrid version of classwide peer tutoring known as peer-assisted learning strategy. Harris et al. (2000) and Marchand-Martella et al. (2000) also used peers to deliver the repeated reading intervention.

In addition to fluency, Strong and her colleagues (2004) examined reading comprehension in a study. They used a teacher as a live model when examining the effects of repeated reading in conjunction with Corrective Reading on the reading fluency of junior high students identified with emotional disabilities. Corrective Reading is a scripted direct instruction program comprised of word attack, group reading, and workbook exercises. Based on the placement assessments, the B1 level of the *SRA*

Corrective Reading Decoding Series was selected. This strand focuses on practicing a variety of word-attack skills as well as leading students in group reading in which they read stories out loud and answer a series of comprehension questions after short sections of the text. With repeated reading, the students read aloud short passages of text several times through in order to improve their oral reading fluency. The first phase of the intervention involved the implementation of Corrective Reading to the entire class. The second phase investigated the effects of adding repeated reading to the Corrective Reading intervention. For the first reading, students were taken in pairs and chorally read passages twice with an adult. Then they alternated individually reading the passage aloud while the second one read silently providing corrective feedback. After four readings, each student read a new passage at the same difficulty level as the previous passage for a 1-minute timed reading in order to get a measure of both oral reading rate and accuracy. Results of the study demonstrated that all six students experienced moderate reading fluency growth during implementation of the Corrective Reading program. When the repeated reading intervention was implemented in conjunction with Corrective Reading, four of the six participants exhibited an increase in reading rates both at their functional level and in age/grade leveled text. The same four students were also more accurate in their responses to comprehension questions during the repeated reading phase.

Scott and Shearer-Lingo (2002) also used a repeated reading intervention as a means of improving the reading fluency of three middle school students with emotional disabilities. The following reading programs were used: *Teach your Child to Read in 100 Easy Lessons* and *Great Leaps Reading.* In both programs, the teacher served as the live

model for reading. Teach Your Child was introduced first to ensure that the students possessed the skills needed to enter the Great Leaps program. In the Teach Your Child program, the teacher models letter-sound correspondence, leading the student through practice with the sounds. Great Leaps is a remedial reading program aimed at improving students' reading fluency. Students leap from one task to a progressively more difficult task when they read a page in either phonics, sight word phrases, or graded reading passage in one minute. Each student was provided with individual instruction during 10-minute sessions and repeatedly read the same lessons each day. After reaching a criterion-reading rate, students moved on to the next lesson. Each new lesson began with a review of errors from the previous lesson. All three students showed increasing trends in reading proficiency with moderate gains in reading rate. Their results revealed that oral reading fluency rates remained stable across all students during the baseline phase and showed little increase during the Teach Your Child Phase. However, once Great Leaps was implemented, the students' fluency rates increased significantly. The results demonstrated that a functional relationship existed between repeated reading and oral reading fluency during the Great Leaps phase, but reading comprehension was not examined. However, these researchers failed to use a generalization measure to determine if participants' gains were being applied to unknown passages outside of the Great Leaps program.

Similar to Scott and Shearer-Lingo (2002) and Strong et al. (2004), a study conducted by Alber-Morgan et al. (2007) targeted middle school students with behavior problems. The study examined the effects of repeated readings with systematic error

correction and performance feedback on students' reading fluency and comprehension. The examiner served as a live model by reading missed words. Similar to Strong et al., the repeated readings component was added to the Corrective Reading program. The researchers assessed literal and inferential comprehension along with correct reading and error rates. They also added a prediction component to the last phase of the study. The repeated reading condition included a systematic error correction procedure and a performance feedback component. The students were presented with a passage and reading errors were recorded and reviewed upon completion. Then students participated in two 1-minute timings, with the students encouraged to beat their previous time. A comprehension test was administered after the second 1-minute reading. During the repeated readings plus prediction phase, the students were asked to make a prediction about the topic of the passage by first the title, and then make a second prediction after reading the first two sentences of the passage. After the second prediction, the students read the entire passage, followed by a discussion on the accuracy of their prediction. Two 1-minute timed readings were conducted again, followed by a comprehension assessment. Results indicated a functional relationship was demonstrated for repeated readings on correct words and errors per minute for three of the four participants. The repeated readings intervention phase had a significant, positive effect on reading fluency, an immediate positive effect on literal comprehension, and a delayed positive effect on inferential comprehension for all four students. Repeated readings plus prediction did not result in any further gains in reading fluency, and, for only one student, influenced a positive change in the level and stability of literal and inferential comprehension.

Two additional studies that included a combination of Corrective Reading instruction with repeated reading were conducted by Harris et al. (2000) and Marchand-Martella et al. (2000). Each study examined the effects of both interventions on the reading performance of high school students. High school peer instructors and students in need of reading remediation were assigned to dyads or triads. With training, the peer instructors delivered the Corrective Reading program, conducted repeated reading trials, and took rate and accuracy measures. Pre and post data were collected on vocabulary and comprehension tests, oral reading fluency and accuracy, number of repeated readings on initial and final lessons, and lessons completed. The results of each study showed that the combination of the instructional strategies and curricula not only showed gains in vocabulary and comprehension, but oral reading fluency increased and accuracy remained at high levels. The average number of repeated readings of Corrective Reading passages decreased as well during both studies. This is noteworthy because in Corrective Reading, the difficulty of the material steadily increased. However, since the number of times the students had to reread each passage decreased, the students became more fluent readers because they could tackle reading passages that were more difficult at the end of the intervention as compared to the beginning of the program.

Homan and her colleagues (1993) compared the effects of repeated reading to assisted non-repetitive reading strategies such as echo reading, assisted cloze reading, and unison reading on sixth-grade students' reading fluency and comprehension. The students were administered one of the two treatments: repeated reading and non-repetitive reading. In the repeated reading phase, students reread the text four times with

peer and teacher supervision, but no feedback. During nonrepetitive reading, the material was only read once. In echo reading, the teacher served as the live model by reading a phrase or sentence, followed by the students reading the same phrase or sentence. Unison reading involved the teacher and student reading together, at the same time, with the teacher assuming the lead role. The teacher served as a model of appropriate reading during the assisted cloze reading session by reading a selection, stopping intermittently, and allowing the student to read the next word in the text. Results indicated variable benefits for repetitive and nonrepetitive methods in reading rate, with improvement in comprehension for both as well. However, reading text repeatedly did not improve rate or comprehension as much as the assisted non-repetitive reading condition.

To measure the effects of repeated reading coupled with word boxes on reading fluency, Devault and Joseph (2004) conducted an investigation with three high school students with severe reading delays. Word boxes are a phonic technique used during Reading Recovery lessons (Clay, 1993). Rectangles representing the number of sounds in a given word, are drawn on a page, and children are directed to move magnetic or tile letters into the respective sections of the rectangle boxes as each sound in a word is articulated. In this study, word boxes were incorporated with repeated readings of passages to provide participants with a concrete strategy for corrective feedback when attempting to decode unknown words. Instructional procedures included a one-minute cold reading of a passage above the students' independent reading levels, followed by a short intervention using word boxes to decode words read incorrectly during the first reading, followed by a second timed reading. The instructor served as a reading model

by reading the word printed on the index card, then slowly articulating the sounds of the word. The instructor then required the student to articulate the sounds while simultaneously sliding the letters into the divided sections of the rectangle. All three students increased the number of words read correctly per minute between initial and second readings during the intervention on passages read at and slightly above their ability level. Comprehension of the passages was not assessed.

Mercer and colleagues (2000) conducted a study to improve middle school students with learning disabilities' reading fluency by providing repeated readings and phonological skills instruction. The *Great Leaps Reading Program* was used during this study. Their study questioned whether repeated readings of letter-sound correspondences, high frequency words, and repeated oral readings of stories result in an increase in students' reading achievement. The daily 5 to 6 minute fluency intervention focused on phonics, sight phrases, and oral reading. All instruction was in a one-on-one setting and repeated readings were divided in three groups according to the length of the intervention. Sessions were divided into four components: (a) instructor modeled the correct pronunciation of the phonemes and prompted the student to read as many sounds as they could for one minute, (b) the students were prompted to read sight phrases for one minute, (c) students were prompted to read passages orally for one minute, and (d) student performance was charted and monitored for progress. The study's findings revealed that all groups made significant progress in reading during the intervention. Group 1 achieved 3.14 grade levels during their 19-25 month intervention. Group 2 achieved 3.08 grade levels during their 10-18 month fluency intervention. Group 3

achieved 1.82 grade level growth in their 6-9 month involvement. All groups made substantial gains in their fluency scores.

Studies by Skinner et al. (1997), Skinner et al. (1993), Rose and Beattie (1986), and Rose and Sherry (1984) all showed fairly consistent improvements in reading rates and decreases in error rates when using an adult as a model of good reading as well. Additionally, Skinner et al. (1997) found better results when the adult model of good reading read at a slow rate of approximately 50 words per minute while the student followed along as compared to the adult models reading at a fast rate.

However, in a more recent study, Wexler et al. (2010) examined the impact of interventions implementing repeated reading and wide reading practices in a peer-paring format on fluency, comprehension, and word reading outcomes for high school students with reading disabilities. Students were assigned to one of three groups: repeated reading, wide reading, or typical instruction. In the repeated reading condition, students read the same text three times and the higher-level reader served as a model for the lower-level reader and provided corrective feedback. In the wide reading condition, passages were read only once and each partner read three different texts only once. Students in the third group participated in normal instruction. The results indicated that students in the wide reading and repeated reading groups did not outperform the comparison group in word reading, fluency, or comprehension. These findings do not support previous research documenting the positive impact peer-pairing or peer tutoring has had on improving reading fluency for struggling adolescent readers (Harris et al., 2000; Marchand-Martella et al., 2000; Strong et al., 2004) or for younger students with

reading disabilities (Chard et al., 2002). Similar to a concern addressed by Fuchs et al. (1999) in her PALS study, Wexler and her colleagues suggested that peer-pairing formats may be inappropriate for classes in which all students experience significant reading difficulties, especially if there are not opportunities to pair students who are better readers to those who are weaker.

Repeated Reading without a Model

Five studies examined the effects of repeated reading without a model or previewing procedure (Carver & Hoffman, 1981; Herman, 1985; Steventon & Frederick, 2003; Valleley & Shriver, 2003; Vandenberg et al., 2008). Repeated reading without a model involves having students independently read a passage within a specified amount of time without having the passage modeled prior to reading by, for example, an adult or tape recording. These studies examined whether repeatedly reading text would increase reading rate and/or have an influence on comprehension. Each student read text independently a minimum of one time and a maximum of ten times and/or until a certain criterion was met such as three consecutive fluency improvements. Similar to the results noted for repeated reading studies using a model, several repeated reading studies without a model also resulted in slight increases in reading rate and one reported improved comprehension skills.

Carver and Hoffman (1981) investigated how a computer-based version of repeated reading would affect reading achievement. High school students who were poor readers read text displayed on a computer screen. Every fifth word in the text was replaced by a choice between the original word and an incorrect one. Students repeatedly

read each text until they achieved mastery. The study resulted in significant gains in reading fluency and evidence that gains transferred to new material. However, the findings were less robust when the students attempted to read passages that were more challenging. Even though the authors reported a gain in reading fluency, no gain was achieved in the participants' overall reading ability.

Over a three-month period, Herman (1985) had eight immediate grade students choose five stories to read repeatedly. She investigated the effects of repeated reading on those students who read between 35 and 50 words per minute on instructional passages. Changes in rate of reading, number of speech pauses, and word recognition accuracy were analyzed for the initial and final reading of the first practiced passage and for the initial and final reading of the last practiced passage. Comprehension was estimated indirectly by combining quality miscues with the total number of words read correctly. Students practiced reading their respective passages for 10 minutes before tape-recording themselves reading the same passage as fast as possible. Students read each passage until they achieved a goal of 85 words per minute, at which point they started a new passage. Most students practiced reading the passages for 4 days before reaching the 85 words per minute criterion. After about 3 weeks of instruction, Herman concluded that accuracy and reading rate increased and transferred to new passages. Rate and scores that reflected comprehension increased and the number of miscues decreased not only within practiced passages but also between passages.

Using a repeated reading condition combined with the Corrective Reading program, Steventon and Frederick (2003) examined middle school students' performance

to determine its effectiveness on their oral reading fluency on practiced and unpracticed passages. A daily repeated reading intervention of four rereadings of Corrective Reading passages from a previous lesson's story was added. During intervention, students were instructed to read passages aloud three times each with the teacher giving corrective feedback and encouragement. Students then read the passage once more and only those scores were calculated and recorded. An unpracticed portion of the same story served as a measure to determine if effects of the repeated reading intervention generalized to unpracticed passages. The adolescents who participated showed slight improvements in reading rate from baseline to intervention on practiced passages, but the improvement did not generalize to unpracticed passages.

A study by Valleley and Shriver (2003) investigated the effects of ten weeks of repeated reading intervention on the reading fluency and comprehension of four high school students. The intervention consisted of students reading and rereading a passage until they demonstrated three consecutive fluency improvements. The passages used were at their instructional level, at the ninth grade level, and on generalization passages from their school curriculum. Results demonstrated that fluency improvements were achieved for all of the participants, but effects on comprehension were not as clear. It was also found that study participants' gain in reading fluency were greater in words correct per minute than those of a comparison group made up of average high school readers.

Vandenberg et al. (2008) examined the efficacy of repeated readings on the oral fluency rate and reading comprehension skills of three high school students identified as

learning disabled in reading. During the intervention, students were asked to read passages and remember and understand what they read. Each student repeatedly read a passage until a specific fluency criterion was reached. Once met, a comprehension test was administered and students were not allowed to look back at the story while taking the assessment. The students recorded their daily performance throughout the study. The process continued until each student repeated five repeated reading conditions, then each student continued to participate in probe conditions that assessed maintenance of the intervention until the end of the study. The results revealed that repeated reading increased the participants' oral reading fluency and comprehension accuracy of practiced and unpracticed passages. All three students improved their fluency rates and increased the number of comprehension questions answered correctly once the repeated reading condition was introduced on practiced and unpracticed passages. This finding is similar to other research demonstrating that repeated reading improves the fluency and reading comprehension of adolescents with learning disabilities (Alber-Morgan et al., 2007; Carver & Hoffman, 1981; Fuchs, Fuchs, & Kazdan, 1999).

Previewing

Previewing is a form of non-repetitive reading involving pre-exposure to materials before they are formally read (Rose, 1984). Having students preview what they read has been shown to improve oral reading performance (Rose, 1984). During this intervention, a student previews the material silently, or a teacher reads an assigned passage out-loud while students follow along silently prior to independent reading. The listening condition can take the form of a student to listening to an audiotape with a

selected passage or another person reading the passage. Sometimes, words from the passage are presented in a word list and then previewed. Three types of previewing procedures are commonly used: (a) oral previewing, in which the student reads an assigned selection aloud prior to and after instruction, (b) silent previewing, in which the student reads an assigned selection silently prior instruction and then aloud to the teacher, and (c) listening previewing, in which the teacher reads the assigned selection aloud and the students follow along silently. In some variations, such as listening to a teacher reading, students can gain exposure to vocabulary, phrasing, and emphasis before reading the text themselves. Moreover, previewing text material may make it simpler to anticipate and predict words that are more difficult.

In another study, the effects of three instructional interventions: (a) listening passage preview; (b) subject passage preview (SSP), in which the subject independently reads a passage before being assessed; and (c) taped words, in which the subject reads along with a list of words presented by audiotape were compared (Daly & Martens, 1994). Students were assessed to determine the effects of treatment conditions on reading performance: accuracy and fluency on passages and word lists. The listening passage preview intervention (which contained modeling, drill, and generalization components) produced the greatest immediate gains in accuracy and fluency in passages read for each student; however, the magnitude of these gains differed across participants. These results are consistent with previous research that has found that listening passage previewing increases oral reading fluency in passages relative to no previewing and silent passage previewing (Rose, 1984; Rose & Beattie, 1986; Rose & Sherry, 1984).

Skinner et al. (1993) investigated the effects of three different previewing sessions—fast-rate listening previewing (FRLP), slow-rate listening previewing (SRLP), silent previewing (SP) with high school students with learning disabilities. The fast-rate and slow-rate listening previewing conditions involved modeling by an adult, a strategy for building fluency discussed earlier. Under fast-rate listening previewing, students followed silently as an adult read 77% faster than the students' oral reading rate. During slow-rate listening previewing, students followed along as an adult read at a rate that was 22% faster than the students' reading rate. Students were told to read passages silently under the silent previewing condition, then aloud to the teacher without any modeling or correction feedback. Decreases in error rates occurred under the SRLP and SP conditions. However, the SRLP intervention resulted in significantly fewer errors per minute than FRLP. These results suggested that orally reading to students at a rate much higher than their current rates while they followed along may not be as beneficial as reading at slower rates; findings similar to the study conducted by Skinner et al. (1997). They compared rapid and slow oral previewing procedures, and found that students read best when the adult previewing the material reduced his/her rate of reading However, all three previewing interventions in the Skinner et al. study resulted in higher oral reading rates and lower error rates than during baseline.

Rose (1984) compared the effects of silent previewing and previewing with listening in six adolescents with learning disabilities (LD). Rose concluded that both previewing procedures increased fluency relative to the baseline (no previewing) condition, and that the highest levels of performance were achieved in the listening

condition. Rose and Beattie (1986) compared the effects of teacher-directed and taped previewing on four students with LD. Both conditions resulted in greater fluency than the baseline condition, and the listening previewing condition was again associated with the highest oral reading rates.

Generally, having students preview text with some type of model of good reading or having an adult provide a model of good reading, regardless of the presence of corrective feedback, have positive effects on reading rate, although these improvements may not necessarily generalize to word reading accuracy or comprehension. The inconsistent effects on comprehension point to the need to include comprehension measures as a regular part of conducting reading fluency research making the two interconnected.

Student Choice

Affording students choices in the classroom is a well-supported motivational practice (Guthrie et al., 2006). When students can choose (a) the texts they read, (b) the tasks they perform with the texts, or (c) their partners during instruction, their intrinsic motivation for reading increases, as well as their time spent on reading activities (Guthrie et al., 2006). Students who choose reading for a personally relevant purpose likely will be more motivated to accomplish that task resulting in more effort put into the act of reading. Choice as an antecedent intervention has been shown to improve student behavior in a variety of ways (Daly, Garbacz, Olson, Persampieri, & Hong, 2006; Reutzel & Smith, 2004). As a clinical intervention, choice has been used to increase adaptive behaviors and decrease maladaptive behaviors (Daly et al., 2006). However, engagement

and reduced disruption or destructive behaviors are only correlates of academic responding. A more efficient approach may be to target academic responses directly.

Providing students with the opportunity to choose their reading materials has the potential to increase student interest, engagement, and motivation in reading. Indeed, choice may promote a sense of ownership and control that adolescents who struggle with reading rarely experience (Guthrie & Humenick, 2004). Choice may also cultivate positive self-perceptions, attitudes, and expectations toward reading that may result in an increase in students' achievement, attitudes, and persistence (Guthrie & Humenick, 2004). When students develop interest and control in their learning, when they take an active role in their learning, achievement improves. If struggling readers are to learn to read successfully, a classroom context must be present in which students are led to believe in their abilities to learn to read (RAND, 2002).

Student choice in selecting reading materials can have a favorable impact on reading fluency (Daly et al., 2006). However, one issue in connection with students choosing their independent reading materials is the "Goldilocks principle," or finding the "just right match" between student and text (Reutzel & Smith, 2004). Although encouraging students to choose materials may invoke their interests and offer some compensatory reading benefits, the issue of selecting texts to read that are too challenging or too easy raises concerns (Reutzel & Smith, 2004).

Daly et al. (2006) examined the effects of student choice on oral reading fluency. In this study, students chose whether to be instructed, and, if so, how they wanted to be instructed prior to reading passages, and rewarded after passage reading for reading at

pre-determined criterion fluency levels. The passages were at students' instructional reading level. The antecedent instruction component provided choices of modeling, practice, error correction, and performance feedback procedures, all strategies with demonstrated empirical efficacy (Chard et al., 2002). In the reward and feedback component, students could earn tangible or edible rewards for meeting predetermined fluency levels. The results indicated that students increased their oral reading fluency rates in criterion passages when choice of instructional antecedents and the delivery of those antecedents were combined with reinforcement contingencies for improving rate of responding. This study demonstrated the positive impact choice might have on reading fluency and ultimately reading performance in general.

Duet Reading

Duet Reading, sometimes referred to as shared reading, is a fluency-building reading strategy originally developed by Siegfried Englemann (2005). In Engelmann's version, the student and teacher sit next to each other and alternate reading words from the same story. While no experimental data exist verifying its effectiveness, Engelmann (2005), based on clinical evidence, suggested duet reading is effective because (a) it motivates students by providing a novel context for reading, (b) the presence of context clues makes the task easier than reading words in isolation, (c) there are built-in models of words read quickly and accurately, and (d) it teaches the skill of "looking ahead" to anticipate the next word to be read.

Jones and Bursuck (2007) conducted a study adapting Englemann's version of duet reading for high school students by incorporating a number of additional strategies

that may be beneficial for adolescents such as peer-mediated practice, goal setting, student choice, and self-monitoring. In their version, two pairs of African American high school students with learning disabilities with similar reading levels and oral reading rates read graded passages of their choosing in the every-other-word, duet reading fashion. Each daily passage was read three times in this manner. After each reading, the number of words correct per minute was shared and graphed, and drill was provided on words missed. Using an AB single subject design, the participants made gains on daily cold or unrehearsed readings of passages conducted prior to each daily duet reading session. Jones and Bursuck's findings, while preliminary, show promise, but are in need of validation under more scientifically-controlled conditions.

Summary

The ultimate goal of reading is to comprehend text (NRP, 2000). Adolescent students are faced with reading and understanding complex content at a rapid pace, creating challenges for struggling readers. One component of reading that may help students understand the text they read is reading fluency (Dudley, 2005), the ability to read a text accurately, quickly, and with expression. When students are able to read text with speed and accuracy, they do not have to struggle at the word recognition level, making it more likely that they will be able to comprehend text (Dudley, 2005).

Educators, educational researchers, and theorists have called for more attention to direct instruction in fluency. Automaticity theorists suggest that it is through extended and repeated practice that readers develop reading fluency. For years, the importance of instruction in reading fluency has been proposed for teaching students to read quickly,

accurately, and with proper expression. However, it remains evident, that a serious fluency weakness among struggling adolescent readers continues to exist and that a persuasive case can be made for the need and importance of fluency instruction.

While a considerable body of literature exists to support the positive relationship between reading fluency and reading comprehension (Meyer & Felton, 1999; Pikulski & Chard, 2005; Rashotte & Torgeson, 1985; Therrien, 2004), research indicates that adequate fluency and word recognition skills do not automatically lead to effective comprehension (Rasinski et al., 2006; Samuels & Farstrup, 2006). The RAND Reading Study Group (2002) described how the reader, the text, the task, and the context all work together to affect reading comprehension performance and that fluency can be conceptualized as both an antecedent to and a consequence of comprehension. Some aspects of fluent reading may depend on a thorough understanding of a text, making some components of fluency appear to be prerequisites for comprehension.

Indeed, the relationship between fluency and comprehension is a complex one. This complexity was reiterated by Strecker, Roser, and Martinez (1998) in their review of fluency research: "The issue of whether fluency is an outgrowth [of] or a contributor to comprehension is unresolved. There is empirical evidence to support both positions" (p. 300). However, they also stated, "Fluency has been shown to have a 'reciprocal relationship' with comprehension, with each fostering the other" (p. 306). Despite the complex and slightly ambiguous relationship between reading fluency and comprehension, it is obvious that a relationship does exist.

The studies reviewed reveal a tenuous, but important relationship between comprehension and fluency. Although it is not clear from the studies what role the development of fluency plays in the development of reading comprehension, the studies provide a persuasive case underscoring the importance of the relationship between fluency and comprehension and the potential value of including a comprehension component in treatment conditions. Fluency building interventions with a comprehension component could be effective in improving reading fluency and comprehension, rather than those that focus on fluency only or comprehension only.

In this review, repeated reading studies seemed to improve rate on practiced passages, passages that share a high degree of word overlap, or intervention related tasks. However, gains in fluency from repeated reading interventions did not necessarily generalize to other reading tasks requiring the reading of unrehearsed passages, passage comprehension, and word attack skills. Although improving rate on practiced passages is beneficial because adolescent students have so much complex text they need to read, it is important that gains from time spent on a fluency intervention are transferrable to unpracticed passages and have a positive effect for comprehension and word reading accuracy as well.

Research has examined the relationship between fluency and comprehension. Few fluency interventions in this review resulted in the development of better comprehension. In addition, the correlation between oral reading fluency and comprehension decreases as students get older and text gets more complicated (Paris, Carpenter, Paris, & Hamilton, 2005). Other factors such as background knowledge or

working memory may play a larger role in comprehending text as students get older. As Homan et al.'s (1993) research demonstrated, time spent reading text repeatedly may be better spent reading a variety of text non-repetitively, exposing them to a greater variety of text structures and vocabulary.

However, while fluency may not directly cause comprehension, it does play a facilitative role, and for struggling adolescent readers, instruction and practice in this area will prove useful. Further, repeated reading may be enhanced for adolescents by including elements such as peer mediation, and student choice as in the study conducted by Jones and Bursuck (2007). Adding a vocabulary and/or comprehension component to fluency building activities such as Corrective Reading or Read Naturally, a fluency building program designed to improve reading fluency using a combination of books, audiotapes, and computer software (Archer et al., 2003) could be considered. Clearly, for older students, the role of fluency instruction in general and the relative effects of differing instructional approaches (e.g., repeated reading versus nonrepetitive wide reading) for improving reading outcomes need additional research.

If the teacher's goal is to help adolescents read text with ease so they can place most of their attention on understanding the text, then reading fluency must be taught, practiced, and monitored. Instruction in fluency for adolescent struggling readers who have not achieved appropriate fluency levels in their reading may result in improved comprehension, overall reading achievement, and achievement in content areas that are reading dependent. However, when older students read several years below grade level, it is safe to assume that reading fluency instruction alone will not suffice (Dudley, 2005).

Ultimately, adolescents who struggle with reading need instruction in effective, research-based reading strategies that cover all components of reading, not just fluency.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Introduction

The ability to read fluently is an important skill for secondary students because of the large quantities of text they must read for their classes. High school students with reading disabilities who are not fluent readers also have comprehension difficulties that increase in severity as words and sentences become more complex and as they increasingly are asked to read subject matter text such as science, social studies, and literature. This difficulty creates a sense of having to work much harder than their peers to complete reading assignments and can result in students giving up on academic accomplishment. As a result, researchers and practitioners have begun to focus increased attention on fluency and its contribution to reading success by investigating effective strategies for developing reading fluency.

Oral reading instruction has been used for years to help young children develop reading skills (Kuhn & Stahl, 2003). It allows the teacher to detect word identification errors in reading and to monitor progress in reading. Shared book reading, readers' theatre, and repeated readings are among the most known and used oral reading techniques (Rasinski & Hoffman, 2003). Of all the strategies, however, repeated reading has been well established as an effective intervention for increasing reading fluency and sometimes reading comprehension (Dowhower, 1991; Kuhn & Stahl, 2003) making it a

widely implemented practice. However, few studies have documented the effectiveness of fluency-based instructional strategies for adolescents with significant reading difficulties (Allinder et al., 2001), and the results of repeated reading with adolescents with disabilities have been mixed (Chard et al., 2009; Scammacca et al., 2007). More studies on the use of repeated readings at the high school level are needed.

Purpose and Research Questions

The purpose of this study was to examine the effectiveness of Duet Reading, a variation of repeated reading, on the reading fluency and comprehension skills of high school students with learning disabilities. Duet Reading involves two students with similar reading levels and oral reading rates reading the words of a graded passage together, with each student reading every other word. This study was designed to answer the following research questions:

1. What is the impact of Duet Reading on the reading fluency of high school students with learning disabilities?
2. What is the impact of Duet Reading on the comprehension skills of high school students with learning disabilities?

Participants

The participants in this study were two pairs of high school students (two males and two females) with learning disabilities in reading. Jacqueline and Alayna formed Group 1, and Martin and Charles were in Group 2. They all read with 95% accuracy on fourth-grade level reading passages and reported that their dominant language at school was English. Demographic information about the participants is included in Table 1.

Table 1

Student Demographic Information

Student	Gender	Grade	Age (years)	Ethnicity	Disability	WJ-III GE
Jacqueline	F	10	16	AA	SLD	3.2
Alayna	F	10	16	Hispanic	SLD	2.5
Martin	M	10	16	White	SLD	2.5
Charles	M	9	18	AA	SLD	2.5

Note: AA=African American; WJ-III GE=Woodcock-Johnson Test of Academic Achievement-III Basic Reading Grade Equivalent score; SLD=Specific Learning Disabled. All achievement tests were administered in 2009.

Each participant was assigned a pseudonym for the purposes of organizing and reporting data and to ensure confidentiality. Jacqueline and Alayna were placed in Group 1 because they were enrolled in the same Study Skills class. Martin and Charles were in different classes, but during the same period. The process for selecting study participants is explained in the experimental design section.

Students identified as Specific Learning Disabled (SLD) are found eligible via a discrepancy model following North Carolina guidelines. They must demonstrate a discrepancy between achievement and ability of at least 15 points. Students must also demonstrate inadequate achievement for their age or fail to meet state-approved, grade-level standards in one or more of the following areas: oral expression, listening comprehension, basic reading, written expression, reading fluency skills, reading

comprehension, math calculations, and math reasoning. The disability must also have an adverse effect on educational performance and require specially designed instruction in order for them to qualify as a student with a specific learning disability.

Setting

The sessions took place in the researcher's office during each student's regularly scheduled Study Skills class at a local high school in the piedmont region of North Carolina. It was chosen because the primary researcher is employed at the school. The school is located in a rural section of the county and has a student population of 1,558. That number includes 53% European Americans, 32% African Americans, 11% Hispanics, 1% Asian, and 3% Multi-racial and Native Americans. The intervention was administered for fifteen to twenty minutes each session; the study spanned seven months. The researcher was a female, doctoral candidate. She conducted probe and intervention conditions at a table in her office and sat across from the students at the table. Because there was no class in this room during the study, distractions were minimal. The researcher administered, scored, and interpreted results of all assessments during the screening, treatment, and maintenance phases of the study.

Materials

Fluency Test

The Test of Oral Reading Fluency (TORF) was used to ascertain fluency training levels. It is an oral reading fluency measure with established technical adequacy. It evaluates oral reading fluency on one-minute timed reading samples. The measure of fluency is the number of words read correctly, which is defined as a word read within

three seconds and pronounced correctly. The administrator marks errors while students read to determine their oral fluency sores. The test is divided into four reading levels from first grade to sixth grade, with 18 passages per level to allow for regular monitoring. The TORF's test-retest reliabilities range from .92 to .97 and it also correlates highly with standardized measures of reading comprehension (Good, Wallin, Simmons, Kame'enui, & Kaminski, 2002). Alternate-form reliability of different reading passages drawn from the same level ranged from .89 to .94 (Tindal, Marston, & Deno, 1983). Criterion-related validity studied in eight separate studies in the 1980s reported coefficients ranging from .52 to .91 (Good & Jefferson, 1998).

Reading Passages

The passages used for the study included TORF progress monitoring reading passages, already controlled for readability, along with additional passages the researcher located in other high-interest, low vocabulary books that conformed to the readers' readability requirements. Narrative and expository passages were used to assess reading performance. Before beginning data collection, 60 reading passages were developed at the students' independent reading level as indicated by their scores on the TORF. However, additional passages were developed once the investigator realized that more were needed. Readability of the passages was verified by the Flesch-Kincaid Readability Test, which analyzes and rates text on a U.S. grade-school level based on the average number of syllables per word and words per sentence. All passages were roughly 200 to 300 words long, as recommended by Sindelar, Monda, and O'Shea (1990) and were printed on an 8 x 10 white sheet of paper with text printed in a 12-point font. Each

passage was typed and did not include pictures. The researcher's copies of the passages contained a cumulative word count at the end of each line (see Appendix A).

Dependent Variables

Reading Fluency

The dependent variables were the number of words read correctly per minute and errors per minute on students' cold reads of passages at their predetermined fluency levels. A cold or unrehearsed read is the first time the student views and orally reads a passage. Cold reads provide a more accurate measure of student performance upon which to document student growth (Conderman & Strobel, 2006).

At the beginning of each Duet Reading session, the researcher administered a one-minute cold read and counted and recorded the total number of words read correctly using the standard Curriculum-Based Measurement (CBM) reading protocol (Deno, Fuchs, Marston, & Shinn, 2001). A word was counted as correct if the student independently pronounced it accurately within three seconds without prompting. If the student read a word incorrectly and self-corrects without prompting within three seconds, the word is counted as correct. A word was counted as an error if it is pronounced incorrectly, omitted, or not stated within three seconds.

Comprehension

The Passage Comprehension subtest of the Woodcock Reading Mastery Tests-Revised (WRMT-R) was used as an index of students' comprehension skills and as a pre- and post-test to measure the intervention's impact on comprehension (Woodcock, 1987). It is an individually administered academic achievement test, which compares a child's

performance to other children of the same age. It is a comprehensive battery of tests measuring several important aspects of reading ability. The WRMT-R has good psychometric properties with internal consistency reliabilities ranging from .68 to .98 with a median of .91. The total split-half reliability coefficients range from .86 to .99 with a median of .97. The test provides a standard and grade equivalent (GE) score. Grade equivalent scores were used as indicators of students' grade level comprehension performance. The grade equivalent (GE) represents the grade level and month of the typical score for a student and indicates that the student has attained the same score (not skills) as an average student of that age or grade. It is a rough estimate of their grade level performance. The Passage Comprehension subtest is a measure of reading comprehension at the sentence level that uses a cloze procedure. It requires the student to read a sentence or sentences and fill in missing words based on the overall context. Prior to baseline, and again at the conclusion of the study, the WRMT-R was administered to validate further the impact of Duet Reading on the students' fluency and to examine descriptively its impact on reading comprehension, another dependent variable. Pre and post-test comparisons will be discussed in the next chapter.

Experimental Design

A multiple probe design across pairs of students was used to evaluate the impact of the independent variable (Duet Reading) on oral reading fluency and to determine the functional relationship between the intervention and fluency. The multiple probe design is a variation of the multiple baseline design that provides evidence that a particular intervention has produced an effect by showing that at different times behavior change

occurs if, and only if, the intervention is present (Barlow, Nock, & Hersen, 2009; Kennedy, 2005). A functional relationship is demonstrated when baseline levels are stable and student performance changes only when the independent variable is applied. Robust effects are demonstrated by clear differences in responding with minimal overlap of data paths across conditions (Neuman & McCormick, 1995). Experimental control is strengthened each time the effects are replicated for a different participant.

Similar to multiple baseline designs, multiple probe designs introduce interventions at different times across conditions, behaviors, or in this study, participants (pairs of students with learning disabilities). In the multiple-probe design, repeated measurements continue while the treatment is introduced sequentially across subjects, but never concurrently (Kennedy, 2005). Using this design, the intervention was administered in a staggered fashion once the students' performance on cold reads (words correct per minute) during baseline became stable. While the first group was under treatment, the other dyad remained in baseline. Once treatment began for the next dyad, the previous group goes into maintenance. Experimental control was established when a visible change in the dependent variable occurred after the implementation of the Duet Reading intervention in a time-lagged fashion. The following sections describe each of the experimental conditions implemented in this study: pre-baseline, baseline, intervention, and maintenance.

Pre-baseline

To form the dyads needed for Duet Reading, students needed to have similar fluency levels. A pre-intervention assessment consisted of determining each student's

reading fluency. This was important to determine if the student qualified for the study as well as to determine baseline rates. Fluency is not a stage of development at which readers can read all words quickly and easily. Fluency changes, depending on what readers are reading, their familiarity with the words, and the amount of practice with reading texts (Rasinski, 2006b). Even skilled readers may read in a slow, labored manner when reading tests with many unfamiliar words or topics. Therefore, students should practice orally rereading text that contains mostly words that they know or can decode easily. It is important that fluency instruction should be with passages that students can read at their independent level (Rasinski, 2006b). It is at this level where students are able to practice on speed and expression rather than decoding. When an individual reads a passage with at least 95% accuracy, the passage is considered to be at the reader's independent reading level. Accuracy is determined by the percentage of words a reader can read correctly. For the purposes of this study, participants were given reading passages at their independent reading level to measure their progress in words correct per minute (WCPM), the degree of accuracy needed to conduct fluency training (Bursuck & Damer, 2007).

Prior to the study, students with learning disabilities in reading were approached by the investigator and asked if they would be willing to participate in a daily reading fluency study. They were approached as potential study participants based upon their need for improved reading skills as indicated by their Individualized Education Plans (IEP). All of the selected students read at instructional levels several years below their current grade level as verified by the Basic Reading cluster score of the Woodcock-

Johnson Test of Achievement (WJ-III). All were enrolled full time in a local high school and took a class called Study Skills, which is available only to students who have been identified under the Exceptional Children's category.

Of the twenty-five students screened, ten met eligibility criteria and were asked to take part in the study. Eight students attained 95% accuracy on fourth grade reading passages and two attained 95% accuracy on third grade passages. Of the eight, only six indicated a willingness to participate. Both the program and study were fully explained to the students by the investigator and parental consent, student assent, and adult consent for the 18 and 19-year-old students were obtained (see Appendixes B, C, D). Permission to conduct the study was also secured from the university's Institutional Review Board and school system officials (see Appendixes E and F). The four students who read fourth-grade passages formed Groups 1 (Alayna and Jacqueline) and 2 (Martin and Charles). The two remaining students who read third-grade level passages formed Group 3 (William and Kelsey), but were eventually dropped from the study due to poor attendance.

The intervention implemented, Duet Reading, required that students with similar fluency rates and reading levels work in pairs. Students were placed at the highest reading level at which they are able to read passages with 95% accuracy, which allowed for some growth. Placing students in reading material that is sensitive to growth is essential to finding the appropriate measurement level for repeated reading monitoring during the school year. The Test of Reading Fluency (TORF) was used to determine fluency training levels. The students were administered three one-minute timings on

passages from the TORF from each grade level, second through fifth. Just prior to administering these probes, a recruitment script (Appendix G) was used to explain the purpose of the study and describe the intervention. Students were told that they would be timed reading a passage for one minute. Each participant was instructed to read the entire passage out loud as quickly and accurately as possible. While each student read, the number of words correct and errors per minute, along with the percentage correct, were recorded for each passage read and the median percentage correct for each grade level assessed was calculated. Median scores were used because they are less susceptible to extreme or outlier scores than means. Errors were defined throughout the study as (a) mispronunciations of words; (b) substitutions of wrong words; (c) pauses for longer than three seconds; (d) omissions or skipped words; and (e) reversals of words. Insertions, repetitions, and self-corrections were not counted as errors. The investigator then calculated the number of errors, the total number of words read, and the number of words read correctly per minute (WCPM) for each passage. By dividing the number or reading errors on the probe by the total number of words read and multiplying by 100, the investigator was able to calculate the percentage of errors for each probe. If the number of errors exceeded five percent on any of the placement probes, the reading level was considered too difficult for the student. The screening assessment was concluded when the highest level material at which the student attained 95% accuracy (independent reading level) was reached. Students whose tested fluency levels were the same and who were both below the 25th percentile for that grade level according to oral reading fluency

norms reported by Hasbrouck and Tindal (2006) formed the pairs used for duet reading in this study.

Baseline

During baseline, students individually read unpracticed passages orally for one minute at their fluency training levels with no instruction provided. The researcher timed the students and marked all errors on her copy of the passages. The average words correct per-minute and errors for each pair was recorded daily. Since the goal of a baseline is to establish patterns of behavior to compare to intervention, determining when to leave baseline depended on the variability of behavior and the pattern of responding relative to the conditions (Kennedy, 2005). In multiple baseline designs, robust effects are demonstrated by clear differences in responding with minimal overlap of data points across conditions. In this study, visual inspection of students' words correct per-minute under baseline conditions was used to determine when to begin the intervention and for which groups. Jacqueline and Alayna (Group 1) were the first group to show stable performance on their baseline, so their group began the intervention first.

Intervention Procedure

The intervention was Duet Reading, a variation of repeated reading that is sometimes referred to as shared reading. It was originally developed by Siegfried Engelmann (2005). The version used in this study is an adapted version of Englemann's that involved two students with similar reading levels and oral reading rates reading the words of a graded passage together, with each student reading every other word (Jones & Bursuck, 2007). The participants engaged in the Duet Reading intervention with the

researcher for fifteen to twenty minutes a session. The strategy began with the students selecting a passage from a group of passages previously determined to be at their fluency training level. Student choice was introduced as a way to motivate the students to do their best reading. When students can choose (a) the texts they read, (b) the tasks they perform with the texts, or (c) their partners during instruction, their intrinsic motivation for reading increases, as well as their time spent on reading activities (Guthrie et al., 2006).

Once the passage was selected, each student engaged in a cold read with the researcher. The cold read was for one minute and the words student read correct per minute, and the errors they made in a minute were recorded and charted by the students. The researcher taught the students to graph their results on a fluency chart which the students reviewed at the end of each session. No feedback on missed words was provided during the cold reads. Allowing the students to chart their results provided them with the opportunity to self-evaluate and provided a visual representation of their performance over time. Self-evaluation is a form of self-management that allows students to monitor and compare their progress to criteria set by themselves or the researcher (Sutherland & Snyder, 2007). Self-evaluation can also increase student motivation by providing concrete evidence of their progress (Sutherland & Snyder, 2007).

After the initial cold read, the students performed the duet reading three times for one minute, with each student reading every other word. The duet reading was conducted with the same passage used for the cold read. The students were told that the goal was to

increase the number of words they read accurately per-minute each time, while keeping their number of errors per-minute at similar or reduced rates. Although not recorded, the students were encouraged to set personal goals of the number of words per minute they were able to read accurately. Goal setting has been shown to be an effective motivator for adolescents when engaged in repeated reading activities (Mercer et al., 2000).

The researcher informed the students of the number of words they read correctly per minute after each duet read to let them know if they improved from their previous score. No feedback was provided for mispronunciations made during the duet reading. However, missed words were recorded and reviewed at the end of each duet read. At the end of the session, a final 1-minute read was taken, but not recorded. Although the students' reading rates were not recorded, the reading rates were calculated and shared with each of them as a further motivational strategy. After the final read, each student read the passage in its entirety individually. Each subsequent session began with a brief overview of the group's performance during the previous session.

Once the first dyad made a visually discernible improvement and scored 10 consecutive data points above their baseline mean, the intervention was introduced to Group 2. The charting, self-evaluations, and goal setting proved to be extremely motivating for the students encouraging them to do their best to improve their score from the previous day's session. The students decided early in the intervention that the chart was to be reviewed prior to beginning each session. Seeing the number of words they read correctly encouraged them to focus just as much attention on reading accuracy as they did on speed. At the start of the intervention, some of the students were interested

more in increasing the number of words they read per minute than in paying attention to the number of words they read correctly. However, daily progress monitoring helped them realize the importance and of reading with accuracy.

Maintenance

Once Group 1 showed an improvement over their baseline levels, they went into maintenance. Maintenance was comparable to baseline. Data from cold reads were collected two times per week for the remainder of the study and there was no Duet Reading. Like baseline data, maintenance data were always collected before the instructional session began.

Description of Data Analysis Procedures

Visual Analysis

Visual analysis procedures were used to determine whether a functional relationship existed between the independent variable (duet reading) and the dependent variable (oral reading fluency). Single subject researchers have traditionally relied on visual analysis of graphs for judging intervention effectiveness making the visual inspection of data an accepted method of revealing functional relationships (Horner et al., 2005; Kennedy, 2005). Visual analysis involves judging the amount of data overlap between phases, which helps capture the important concept of data dispersion or variability around a center (Kennedy, 2005). Visual analysis requires careful interpretation of the level, trend, and variability of performance occurring during baseline and intervention conditions. In this study, the researcher visually inspected the variability of the groups' baseline data to determine which group should begin the intervention. The

first group to maintain stable performance began the treatment. When data for intervention were consistently above baseline levels, an effect was established.

In keeping with single subject investigations, the results of this study are presented on a graph and summarized by the researcher, making the results subject to the researchers' interpretation. A study of 124 published single case datasets (Parker et al., 2005) found statistical analysis in only 11%. For the 75 multiple baseline designs sampled in Parker's study, 87% of authors relied solely on visual analysis, with phase percentages or means calculated, but no tests of differences between these phases. Further, a meta-analysis of special education research summarized by Forness (2001) indicated that most researchers failed to use standard effect sizes. However, recent changes in the field of educational research argue for more objective and statistically reliable results when reporting single subject research results especially "magnitude of effect" indices or effect sizes (Horner et al., 2005). Therefore, additional procedures were used to report Duet Reading's efficacy including the percentage of non-overlapping data (PND) and the percentage of data points exceeding the median (PEM). Trend was evaluated by calculating the percent of overlapping data points collected during baseline, intervention, and maintenance phases. In general, the smaller the percentage of overlapping data points, the better the indication that the intervention had an impact. These data analysis procedures are described next. Such analyses permit comparisons between studies, thus allowing single subject studies to be included in meta-analysis and other non-single subject research publications (Horner et al., 2005).

Percentage of Non-overlapping Data (PND)

The percentage of non-overlapping data (PND; Scruggs, Mastropieri, & Castro, 1987) was chosen as a data analysis procedure because it is commonly used when calculating effect sizes in single subject research (Scruggs & Mastropieri, 2001). PND is a nonparametric analysis for examining single subject data. It is the percentage of Phase B (intervention) data that are more extreme (in an improvement direction) than the single most extreme Phase A (baseline) data point. Scruggs, Mastropieri, and Castro (1987) maintained that PND's strength is that it works within the natural constraints of single subject data. When computing PND, the most extreme positive baseline data point was identified and a straight line from that point was drawn through the intervention data. Then the number of data points above the line was divided by the total number of intervention data points. The percentage of treatment data points found above this line is the PND. Because the desired effect of this study is increased WCPM, intervention data points that exceeded the value of the highest baseline point (one minute reads) are considered non-overlapping. Generally, the higher the PND, the more effective the intervention. Scruggs and Mastropieri (1998) offered general interpretation guidelines of PND scores greater than 90% for highly effective interventions, 70%-90% for fairly effective interventions, 50%-70% for interventions with questionable effectiveness, and below 50% for interventions with no observed effect. PND is consistent with the logic of visual analysis because it considers the amount of data overlap between baseline and intervention. In addition, an empirical review of PND data by Scruggs and Mastropieri (1998) found that results were both meaningful and consistent with the original research.

In this meta-analysis, the PND had the highest agreement with visual analysis (92.6%) when compared to other data overlap methods.

Percentage of Data Points Exceeding the Median (PEM)

The percentage of data points exceeding the median (PEM) of the preceding baseline phase technique (Ma, 2006) was chosen to overcome one of the difficulties encountered with the PND method: the presence of outliers in baseline data. A visual analysis of the data revealed several outliers in the baselines. Therefore, to counteract the effect of baseline outliers, PEM was used because it uses all of the data. To compute PEM, the median of the data in the baseline was first identified. Then a horizontal line was drawn through the median point of the baseline phase and across treatment phases. Next, the number of data points in the treatment phase above the line drawn from baseline was counted. Finally, the number of data points above the median was divided by the total number of treatment points. The PEM score has a range of 0 to 1 and has the same meaning as the effect size (Ma, 2006). PEM scores ranging from .9 to .1 reflect highly effective treatment, .7 to .9 reflects moderately effective treatment, and less than .7 reflect a questionable or ineffective treatment.

Reliability Procedures

Procedural Fidelity

Because the investigator also served as the instructor in this study, an independent observer was used to establish Duet Reading's procedural fidelity. In intervention research, procedural fidelity is defined as strategies that monitor (and ultimately enhance) the accuracy and consistency of an intervention to ensure it is implemented as planned

and that each component is delivered in a comparable manner to all study participants over time (Horner et al., 2005). Procedural fidelity preserves validity against error, improves the research efficiency by reducing unintended variability in treatment effect, and supports external validity by allowing replication and dissemination (Neuman & McCormick, 1995). The observer was a special education teacher that worked at the same school as the investigator and agreed to serve in that capacity. Before serving as the independent observer, she successfully completed the Cornell University Committee on Human Subjects tutorial to familiarize herself with the federal rules governing human-subjects research. Prior to implementing the intervention, the researcher conducted an individual training session with the independent observer. The researcher provided the observer with a procedural checklist that included the steps of the procedure (see Appendix H). Training was conducted in one session at the researcher's school and consisted of three parts: (a) the researcher verbally describing the steps for the Duet Reading intervention, procedures for collecting data, and addressing any questions the observer had, (b) the researcher modeling the intervention and procedure for recording words correct and errors per minute (EPM) for the observer with passages that were not used during the study while the observer watches, and (c) the researcher monitoring the observer practice the procedures and providing feedback. The observer was required to perform the intervention and data recording with 100% accuracy in the presence of the researcher before the training was terminated.

Procedural fidelity data were collected through direct observation. The observer was provided a description of the Duet Reading intervention procedures, and copies of

treatment integrity checklists for baseline, intervention, and maintenance (see Appendix H). The observer recorded whether or not (a) the appropriate materials were present, (b) the steps of the intervention were followed in their proper sequence, and (c) the data collection procedures were implemented correctly. Procedural fidelity data were collected on 30% of the sessions. Treatment fidelity was calculated by dividing the number of procedural steps completed correctly by the total number of steps, multiplied by 100. The procedural integrity scores for the entire study averaged 98%, ranging from 94% to 100%. In cases where integrity was less than 100%, the observer and researcher reviewed the results to increase the chances of reaching 100% fidelity in subsequent sessions.

Interrater Agreement

The same observer was used to collect interrater reliability data for the oral reading fluency measure. Interrater agreement for correct and incorrect words per minute was assessed for 30% of the sessions. These data were collected during the same sessions when treatment fidelity data were collected. The observer independently scored each word the student read as correct or incorrect. Reliability was calculated by dividing the smaller of the total words correct per minute by the larger. The overall mean agreement during baseline, intervention, and maintenance conditions was 95%, ranging from 90% to 99%.

Social Validity

Social validity is important for establishing acceptability, usefulness of the assessment and intervention procedures, and satisfaction of those who are recipients of

the given intervention procedures (Horner et al., 2005). Intervention acceptability is one aspect of social validity, referring to the perceived fairness and appropriateness of intervention procedures. Intervention acceptability is an important variable to assess in outcome evaluations of early literacy programs, as it is helpful in determining the likelihood that the instructional procedures in the program will be implemented. Social validity was addressed at the conclusion of the intervention. The students completed a survey containing questions that assessed their repeated reading experience and whether they felt their reading skills improved during the intervention period (see Appendix I). The questionnaire also contained items that solicited students' opinions about the efficacy of various components of the intervention such as charting progress, the 1-minute timings, as well as their opinion of the passages used in the study. A 5-point Likert scale as well as open-ended questions were used. Their responses are discussed in the next chapter.

CHAPTER IV

RESULTS

This study was conducted to examine the effects of Duet Reading on the oral reading fluency of high school students with reading disabilities. Reading interventions do not typically result in an immediate and drastic change in fluency, but rather an incrementally increasing reading rate over time (Deno et al., 2001). As a result, the effectiveness of a fluency intervention is demonstrated when students' performance on novel reading passages increases over the duration of the study. This improvement demonstrates that students' reading fluency is increasing on unpracticed reading passages.

To evaluate the impact of this intervention, a multiple probe across groups of participants design was utilized to determine if a functional relationship existed between the treatment and dependent variable. Two dyads received the Duet Reading intervention. The treatment was introduced in a staggered fashion across the groups once a dyad's performance on the cold reads during baseline became stable. Differences in performance between the baseline and intervention phases for both groups were assessed using a visual analysis of mean words correct per minute and errors per minute for the participants across phases.

A summative evaluation component was used in addition to the visual analysis of the intervention data. The effect of the intervention was measured by calculating the

percentage of non-overlapping data (PND) and percentage of data points exceeding the median (PEM) between baseline and treatment conditions (PND; Scruggs et al., 1987; PEM; Ma, 2006). These methods allowed for comparisons between phases by showing the amount of increase from one phase to the next. Words correct per minute and errors per minute were the primary units of analysis along with pre- and post-test comprehension scores. The results of the study will be presented first by dyads, and then by individual student performance. An analysis of the results of the study is presented in the following sections: (a) group performance including a description of phase change decision rules, (b) individual student performance, and (c) social validity.

Group Reading Fluency Performance

Group 1

A multiple probe design across groups of two was used to examine the effects of the Duet Reading on reading fluency. Figure 1 displays the results for Groups 1 and 2, and shows the average number of WCPM and EPM for each group for each experimental condition. The first dyad to show stable performance during baseline became Group 1 (Jacqueline and Alayna). Their mean baseline performance was 92 WCPM (range = 87-94. Visual inspection of their graph revealed an increase in level with an ascending trend upon implementation of the Duet Reading intervention. Group 1 remained in intervention for 48 sessions and their mean performance for intervention was 102 WCPM (range = 84-118), an increase of 10 WCPM over their baseline mean. Of the 48 intervention sessions, only two data points (84, 91; 4%) fell below the baseline mean.

Figure 1. ***Group Comparison Data***

In addition, Group 1's percentage of non-overlapping data (PND) and percentage of data points exceeding the median (PEM) from baseline to treatment was 81% and 88% respectively, indicating that Duet Reading was found "effective" based on Scruggs and Mastropieri's (1998) and Ma's (2006) criteria.

The original plan was to go to maintenance once Group 1's treatment data scores were ten consecutive points above their baseline mean. However, the students were excited about their improved fluency rates and repeatedly requested that the intervention continue. As a result, the treatment phase was extended for several weeks. A visual analysis of the graph revealed that their WCPM performance dropped during the last two intervention sessions, but were still above their baseline mean. During maintenance, the group met only twice a week and returned to conditions similar to the baseline phase. This phase was introduced to determine if the group's reading rate would continue to improve or at least maintain its level without the presence of the Duet Reading intervention.

An examination of Group 1's maintenance phase revealed variable performance. Their mean WCPM performances on several passages were below their baseline mean and hesitations occurred while reading. Mean performance was 96 WCPM reflecting a range of 86-109, which represented a modest increase over their baseline mean of 92 WCPM, but was lower than the intervention mean of 102 WCPM. PND and PEM were calculated to further analyze the effect of the intervention. These scores suggested that only 57% of maintenance points were higher than the highest datum point in the baseline as well as the baseline median. According to Scruggs and Mastropieri's (1998) criteria,

Duet Reading would rate below "questionable," indicating that based on PND criteria the effects of the intervention were not maintained. Ma's PEM criteria resulted in a similar finding. Interestingly, examination of individual student outcomes with respect to gains in WCPM provided a different picture and will be discussed in a subsequent section.

Group 2

Group 2 (Martin and Charles) was not the original Group 2 to begin the intervention once there was an effect for Group 1. The original Group 2 (William and Kelsey) did not complete the intervention. While William and Kelsey demonstrated stable performance during baseline, after several weeks of the intervention, it was apparent that their inconsistent attendance made it impossible to collect viable data. They were, therefore, dismissed from the study. As a result, Martin and Charles began the treatment phase five months after the study began. They became the new Group 2 and their mean WCPM and EPM performance is displayed in Figure 1. Group 2 met twice a week for 24 sessions during the baseline phase. Visual inspection of their data revealed that their mean WCPM performance initially remained stable, but eventually began to fluctuate and included two significant outliers.

With respect to a visual analysis of Group 2's data, no significant effects were found. There was only a slight increase in mean WCPM performance from a baseline of 93 WCPM, reflecting a range of 82-118, to intervention of 95 WCPM, reflecting a range of 80-116, revealing a gain of only two words correct per minute as a result of Duet Reading. Figure 1 shows that despite the implementation of the treatment, Group 2's intervention data were variable, fluctuating consistently around the baseline mean for the

majority of the 29 treatment sessions. Each phase contained several extreme outliers. Outlying values on baseline measurement can cause serious damage to the estimate of treatment effects (Osborne & Overbay, 2004). Indeed, the calculation of the PND was 0%, a figure obviously influenced by the baseline outliers, a limitation of the PND method. To minimize the influence outliers have on the mean and to provide a better representation of performance, PEM was also calculated because it uses the median baseline score, rather than the highest score. Their median baseline point was 90; 21 of the 29 points in the intervention phase were above the baseline median. As a result, Group 2's PEM score was 72%, revealing a moderately effective intervention according to Ma's (2006) criteria. Thus, the results of the visual analysis and mean analysis for Group 2 were mixed. While a functional relationship between Duet Reading and oral reading fluency was not established, there did appear to be a relationship, albeit not a causal one.

Group Mean EPM

Table 2 shows the mean number of correct words and errors per minute for each group and individual student. Even though there was some variability in the data, all four students showed decreases in their overall mean error rates in all phases of the study on their fourth grade passages. This finding indicates the participants were not limited by unknown words, but rather by their ability to reading fluently. It also shows that gains in fluency did not come at the cost of reading accuracy. Further, even the students who showed little to no improvement as the result of the intervention, decreased the number of mispronunciations they made during each cold read.

Table 2

Pre and Post Test Results of Group and Individual Mean WCPM and EPM for Each Condition

	Baseline		Intervention		Maintenance	
Student	WCPM	EPM	WCPM	EPM	WCPM	EPM
Group 1	**92**	**2.75**	**102**	**1.41**	**96**	**1.39**
Jacqueline	99	3.00	108	1.67	102	1.64
Alayna	84	2.50	94	1.10	89	1.21
Group 2	**93**	**2.35**	**95**	**1.67**	—	—
Charles	86	1.96	86	1.56	—	—
Martin	99	2.79	103	1.76	—	—

Individual Student Reading Fluency Performance

Reading Fluency (WCPM and EPM)

Alayna. With respect to individual gains in reading fluency on the reading passages, outcomes were mixed. Alayna's data are displayed on Figure 2 and Table 2. Her correct reading rate increased from a mean of 84 WCPM (range = 82–88) during baseline to a mean of 94 WCPM (range = 78–114) during the Duet Reading phase, a 10% increase. She had the lowest baseline mean WCPM score of all the participants, but the greatest increase in WCPM as a result of the intervention. Despite the variability of her data, only one intervention point (78) was lower than her baseline mean (84 WCPM).

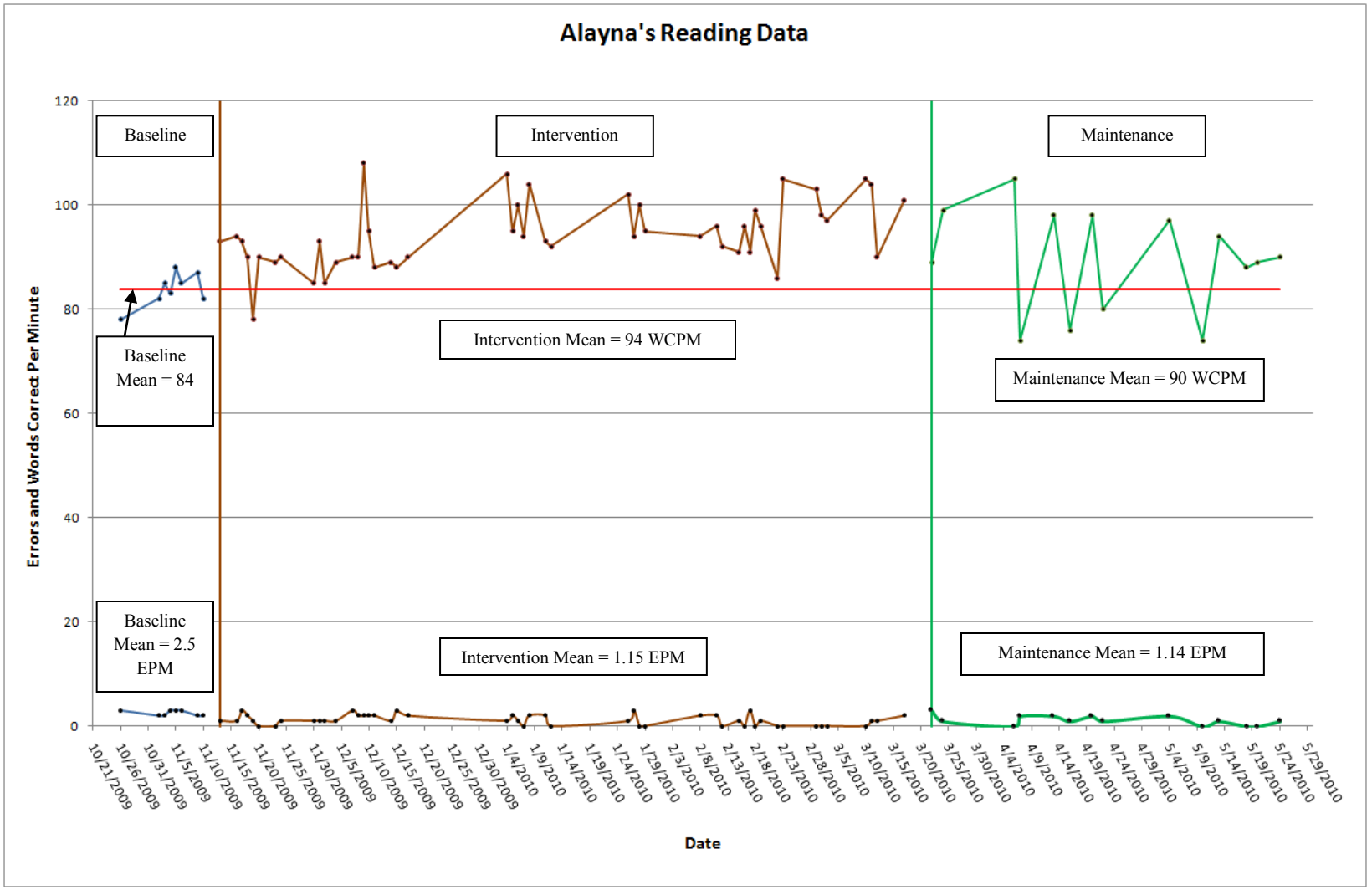

Figure 2. ***Alayna's Individual Reading Data***

Her PND score of 88% suggests that the intervention was moderately effective. Ma's (2006) PEM procedure revealed a score of 98%, reflecting a highly effective intervention.

During the maintenance phase, Alayna's mean fluency performance dropped to 90 WCPM (range = 74-105), but was still higher than her baseline mean of 84 WCPM indicating that the effect of Duet Reading was maintained somewhat. Her PND score of 64% and PEM score of 77% both supported that conclusion, revealing that there was still an effect, even when Duet Reading was discontinued.

Alayna's error rate decreased from baseline (X = 2.5 errors per minute) to the intervention phase (X = 1.1 errors per minute), a decrease of 1.4 errors per minute (EPM). Visual analysis of her data shows some variability in her data during the treatment phase, but none of data points was higher than her baseline mean. On 43 of 48 intervention sessions, her errors per minute were two or less. Her mean error rate for the maintenance phase was 1.2, only a .06 difference.

Jacqueline. Jacqueline was Alayna's partner for the study and her data are displayed in Figure 3 and Table 2. Jacqueline's baseline mean was 99 WCPM reflecting a range of 95-105, and her intervention mean was 108 WCPM reflecting a range of 89-132, representing an increase of 9 WCPM (8%). A within condition analysis indicated that Jacqueline's intervention data exhibited a high degree of variability and overlap. During the first weeks of the intervention, her data fluctuated around the baseline mean, revealing an inconsistent rate of improvement. However, during the latter half of the intervention, her scores remained above her baseline mean for the remainder of this condition.

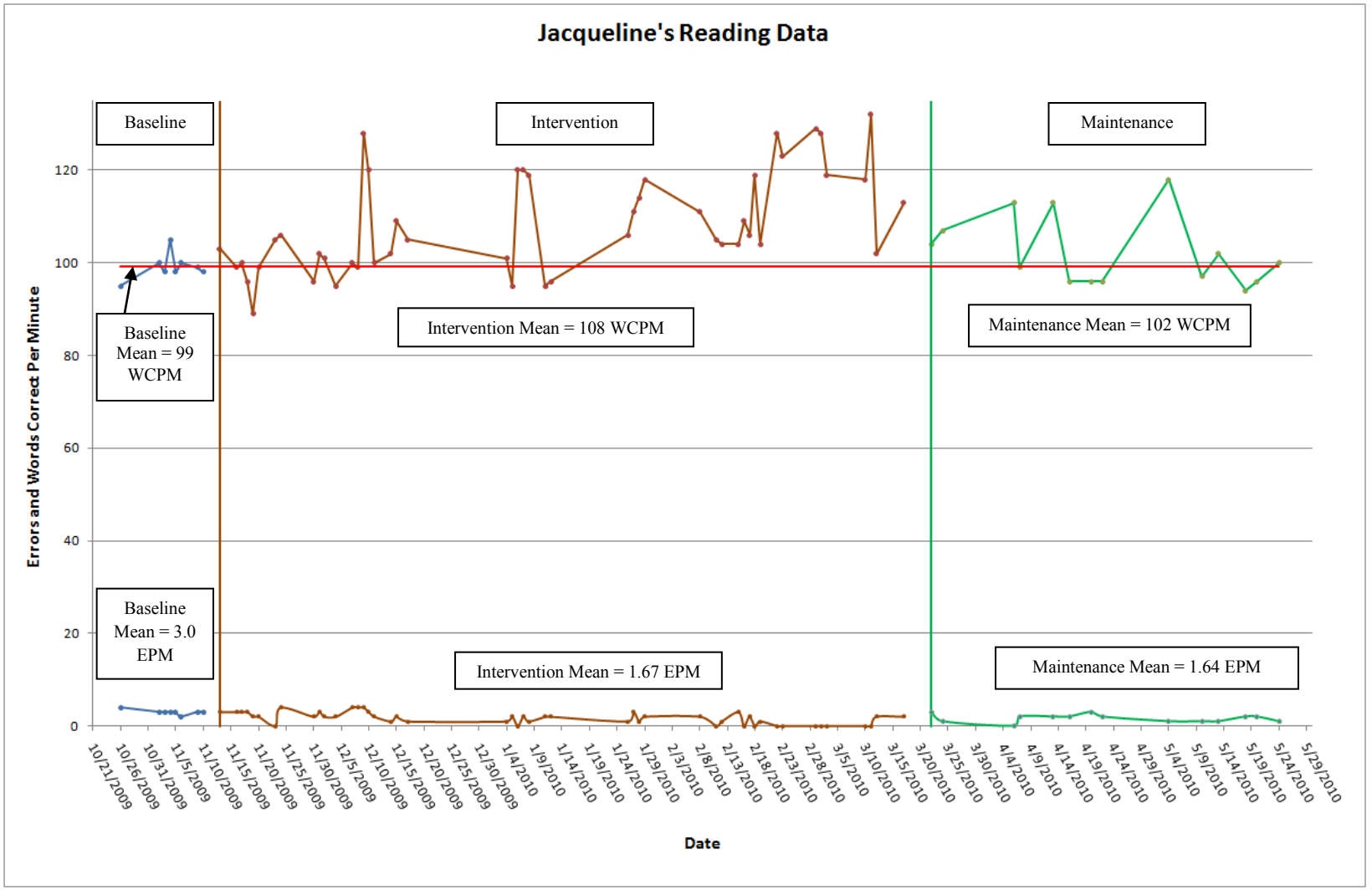

Figure 3. ***Jacqueline's Individual Reading Data***

When comparing the baseline mean of 99 WCPM to her treatment data, 41 of her 48 data points (85%) were above the baseline mean, indicating that the intervention seemed to improve her reading fluency in that phase. However, when comparing the percentage of non-overlapping data between treatment and baseline conditions, her PND score was 46% because only 22 of her 48 intervention score were above the highest score in baseline (105). However, if the influence of the baseline outlier of 105 is removed, and the baseline median of 99 is used to compare the two phases, 37 of the 48 intervention points would surpass the median. Consequently, the percentage of data points exceeding the median (PEM) score would be 77%, indicating that the intervention was moderately effective.

Data variability continued in Jacqueline's maintenance phase with a mean of 102 WCPM reflecting a range of 94-118. Jacqueline was unable to maintain the consistent rate of fluency improvement she experienced in the previous condition. Of the 14 data points collected during maintenance, only 4 were above the highest baseline point (105), making her percentage of non-overlapping data (PND) score 29% revealing that the intervention was ineffective, supporting the conclusion drawn by visual analysis. To counteract the influence of the baseline outlier, the median data point was also used to determine the intervention's impact on reading fluency. Only seven maintenance points exceeded the baseline median of 99 WCPM, resulting in a PEM score of 50%, indicating that the effect of the treatment was not maintained. Jacqueline performed at higher levels during baseline and intervention, and although her performance was variable, she failed to maintain a steady rate of growth through the maintenance phase. Although

Jacqueline's overall mean performance (Baseline X = 99, Intervention X = 108, Maintenance X = 103) was higher than Alayna's (Baseline X = 84, Intervention X = 94, Maintenance X = 90), the intervention had a greater impact on Alayna's reading fluency.

Jacqueline had the greatest decrease in error rate than any other participant. It decreased from baseline (X = 3 EPM) to intervention (X = 1.64 EPM) by 1.36 points. Like Alayna, her data remained variable throughout the study, but with a greater error range (0-4). It did decrease slightly during the maintenance phase (X = 1.64). Overall, once she left baseline, her error rate remained low.

Charles. Charles was one of the students in Group 2. Figure 4 and Table 2 depict his rate of correct words per minute and errors per minute during baseline and intervention conditions. When visually analyzing Figure 4, Charles' baseline data revealed a high degree of variability. His baseline mean was 86 WCPM reflecting a range of 69-108, but baseline data also consisted of five outliers (75, 108, 69, 76, and 104) that affected his mean. Charles remained in baseline for five months.

A visual analysis of his performance, revealed a significant amount of overlap when comparing baseline data to the Duet Reading condition, meaning that when Charles was in the treatment condition, he failed to consistently outperform his baseline scores. His intervention mean was 86 WCPM reflecting a range of 73-105. A between condition analysis revealed a high degree or variability in his intervention scores, which fluctuated both above and below the baseline mean. There were no data points in his treatment phase that were higher than the greatest number in baseline (118).

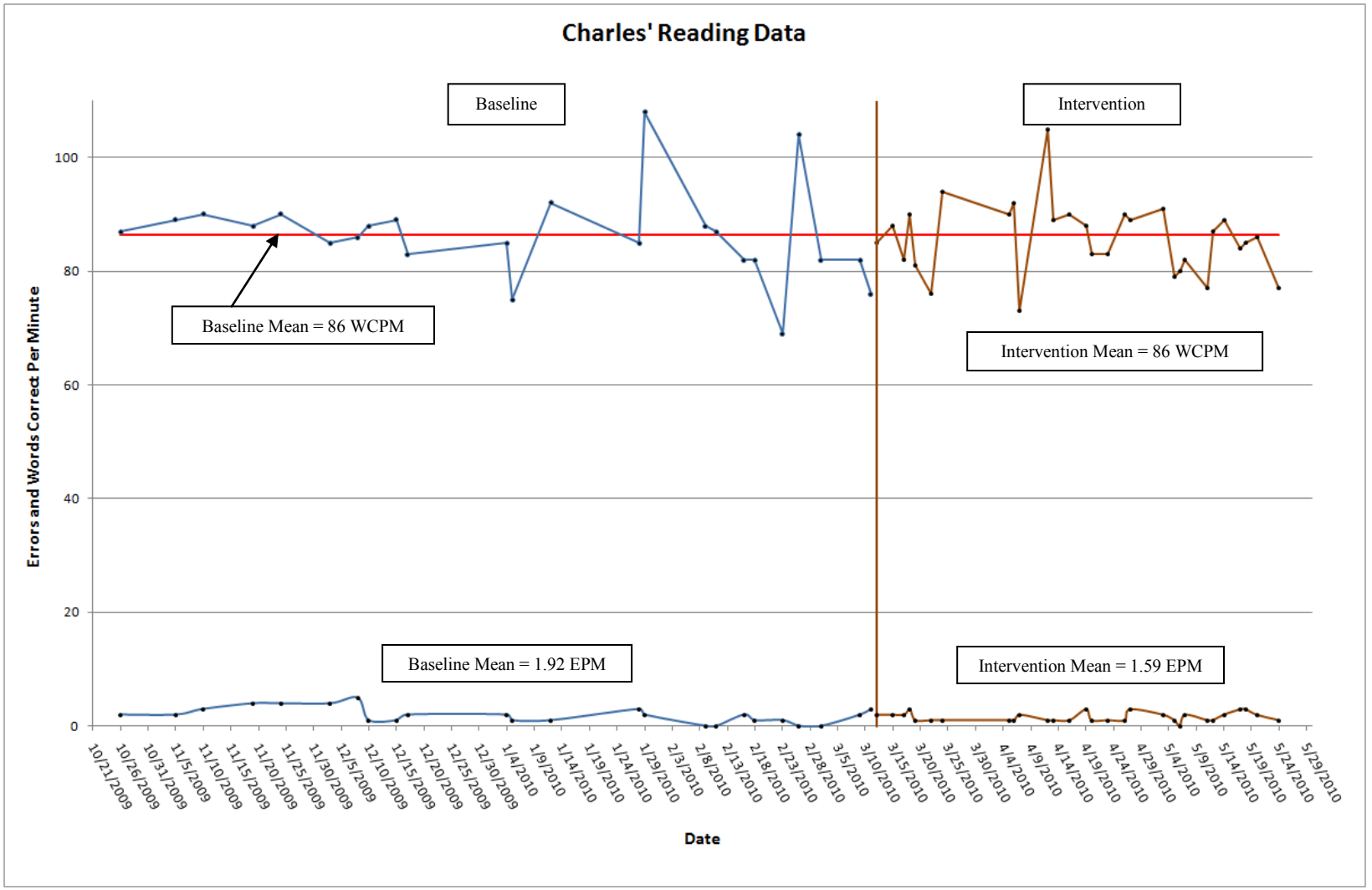

Figure 4. ***Charles' Individual Reading Data***

As a result, his percentage of non-overlapping data (PND) score was 0%, indicating that the Duet Reading was not an effective treatment for Charles. However, to offset the influence of the baseline outlier, the baseline median data point (87) was used. When the median was used instead of the highest score, 13 of the 29 intervention sessions exceeded the median, making his PEM score 45%; this score still reflected an ineffective treatment. Overall, Charles made no significant gains in WCPM during the intervention.

Visually examining Charles' error data revealed that he experienced a slight decrease in errors per minute from baseline (X = 1.96) to intervention (X = 1.56), of .4 points. His baseline data initially experienced a high degree of overlap and variability ranging from 0-5 EPM, but became more stable for the remainder of baseline. Once the intervention was implemented, his error rate remained relatively low, making no more than three errors on reading passages.

Martin. Martin's data are displayed in Figure 5 and Table 2. His baseline mean was 99 WCPM reflecting a range of 88-131. A visual examination of his data also reveals a high degree of variability in both conditions. Similar to Charles, after an extended time in baseline, Martin's data became highly variable which inflated his baseline mean. As a result, only 8 of the 24 baseline data points were above the mean.

Once the intervention was introduced, Martin's performance continued to be variable, with a mean of 103 WCPM reflecting a range of 87-127. There was no clear pattern of WCPM gains, though there was a slight increase of four WCPM.

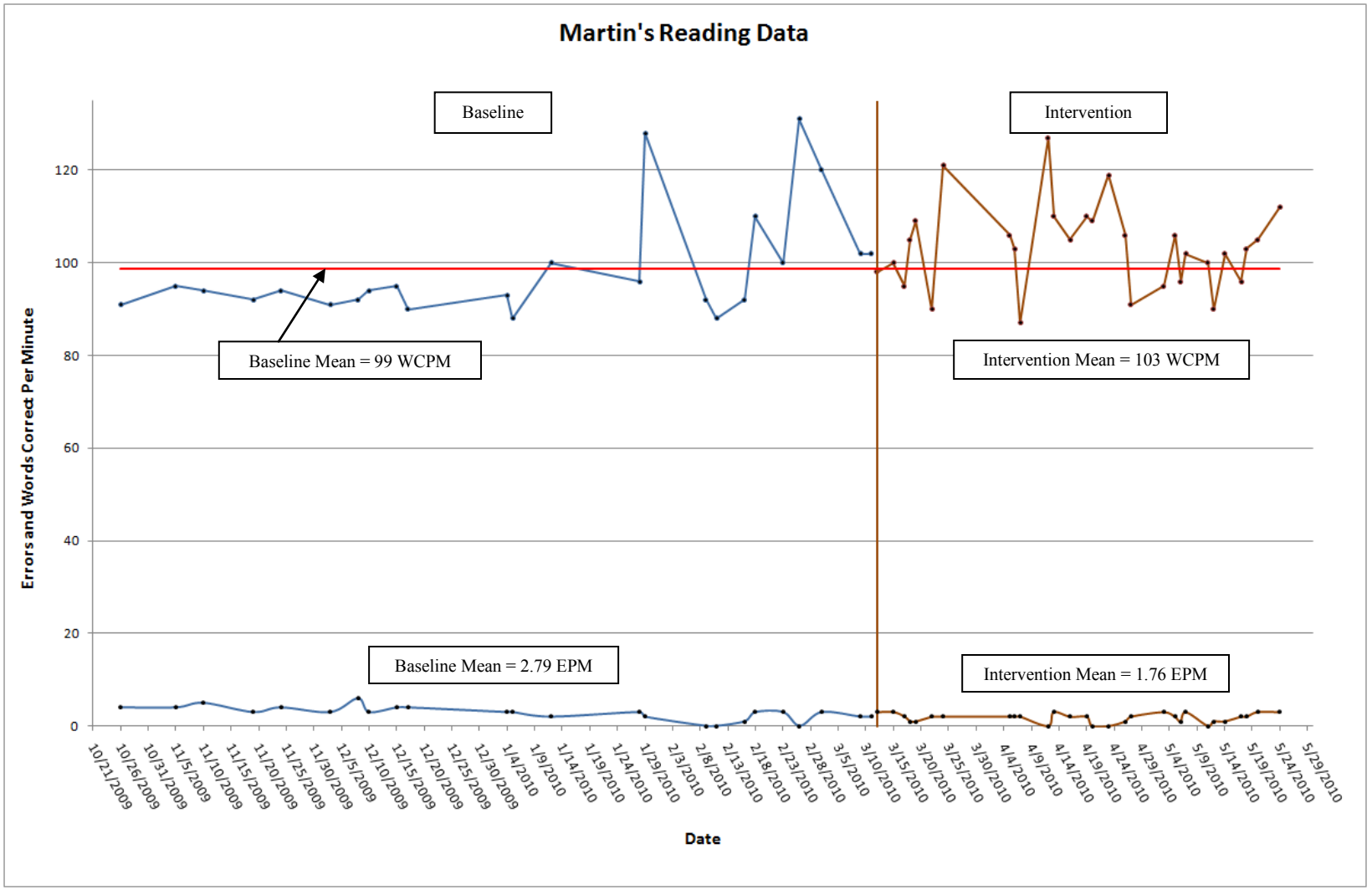

Figure 5. ***Martin's Individual Reading Data***

To further examine the effect of Duet Reading, the PND method was utilized. However, as with Charles, there were no data points in the intervention that were greater than the highest baseline point of 131. Therefore, his PND score was 0% revealing an ineffective intervention. The PEM was also calculated using the baseline median point of 94. Of the 29 intervention points, 25 exceeded the baseline median, making his PEM score 86%. According to Ma's (2006) criteria, the intervention was moderately effective.

Martin's EPM data revealed a significant decrease in errors as he progressed through baseline. His baseline mean was 2.79 EPM and his intervention mean was 1.76 EPM, a difference of 1.03 EPM. While his baseline displayed some variability, with errors per minute ranging from 0-6, his treatment condition remained relatively stable with a range of 0-3.

Comprehension

The impact of Duet Reading on comprehension was assessed utilizing the Woodcock Reading Mastery Test—Revised during pre- and post-testing (see Table 3). The results indicated that Jacqueline (9 months), Alayna (8 months), and Charles (3 months) made some gains on the passage comprehension subtest. There was no improvement in Martin's post-test performance (-3 months).

Tests of Oral Reading Fluency (TORF)

The Test of Reading Fluency (TORF) was administered prior to the study to determine fluency training levels (see Table 3). The test was given again at the end of the study to measure fluency gains. As reported in Table 3, three of the four students showed an increase in words read correctly per minute on fourth grade passages with a minimum

gain of 2 WCPM (mean gain = 11 WCPM). Though not included in the results, the students were tested on fifth grade TORF passages. Only Jacqueline attained 95% accuracy.

Table 3

Pretest and Posttest Grade Equivalent Scores on the Woodcock Reading Mastery Test and Test of Reading Fluency (TORF) on Fourth-Grade Passages

Student	# of Duet Reading Sessions	Passage Comprehension		Test of Reading Fluency	
		pre (post)	gain (loss)	pre (post)	gain (loss)
Jacqueline	48	4.7 (5.6)	.09	106 (125)	19
Alayna	48	3.4 (4.2)	.08	89 (102)	13
Charles	29	3.1 (3.4)	.03	88 (85)	(3)
Martin	29	4.7 (4.4)	(.03)	103 (105)	2

Social Validity

At the end of the study, the students completed questionnaire to assess their satisfaction with the Duet Reading intervention. The evaluation employed a 5-point Likert-type scale (1 = strongly disagree, 2 = disagree, 3 = unsure, 4 = agree, 5 = strongly agree) of agreement with positively worded statements. The following open-ended questions were included as well allowing the students to provide further elaboration on their opinions of the intervention: (a) What did you like best/least about Duet Reading and why?; (b) How do you think this study has affected your reading performance?;

(c) How has your ability to read words more fluently affected your ability to understand the passages we read?; and (d) What is your overall opinion of Duet Reading?

The results of the Likert questions are listed in Table 4. The student averages out of a total possible of 5, were as follows: Jacqueline–5, Alayna–5, Martin–3.53, and Charles–4.33, making the total mean for all responses 4.47. Jacqueline, Alayna, and Charles either agreed or strongly agreed with all of the items on the questionnaire. However, Martin did not have strong opinions of any aspect of the intervention and did not feel that it improved his reading. He recognized the benefit of practicing reading, but since it was an activity he "never liked too much" he did not believe the intervention improved his overall opinion of reading. All students agreed that the intervention was easy to learn, helped reduce their reading errors, and increased their reading rate. Rereading the passages, monitoring progress, and reviewing missed words all received affirmative responses. Only Martin was unsure if Duet Reading improved his comprehension, motivation to read, or helped him recognize more words than before he began the intervention. However, he later admitted that even though the considered the intervention "okay," he appreciated the opportunity to practice reading. Alayna, Charles, and Jacqueline liked the Duet Reading intervention and hoped to continue it next year with passages from their textbooks. All students wanted the opportunity to practice reading passages with more challenging vocabulary. Overall, the majority of student responses were favorable towards the intervention and positive about the study and its results.

Table 4

Social Validity Questionnaire

Social Validity Item	J	A	M	C	Item Average
I feel that Duet Reading helped me read with greater accuracy.	5	5	4	5	4.75
Reading a passage several times made me read a lot faster.	5	5	4	4	4.5
I really liked rereading the passages.	5	5	4	5	4.75
The Duet Reading intervention was easy to learn.	5	5	4	5	4.75
Having the teacher tell me the words I missed helped me read with fewer mistakes.	5	5	4	5	4.75
I made progress by rereading passages and reviewing the words I missed.	5	5	4	4	4.5
When I read faster, I can understand what I read better.	5	5	3	4	4.25
I really liked seeing the progress I was making on the graph.	5	5	4	4	4.5
Keeping track of my daily fluency rate motivated me to read more accurately and quickly.	5	5	3	5	4.5
I would like to keep rereading passages, reviewing the words I missed, and seeing my progress on a graph.	5	5	4	4	4.5
Duet Reading has helped me read faster than I could before.	5	5	4	4	4.5
I read better now than I could before.	5	5	3	4	4.25
When I read, I recognize more words than I used to.	5	5	3	4	4.25
I enjoyed reading more now than I used to.	5	5	2	4	4
I would like to continue Duet Reading next year.	5	5	3	4	4.25
STUDENT AVERAGE	5	5	3.53	4.33	Overall Average 4.47

Note: J=Jacqueline, A=Alayna, M=Martin, C=Charles

Responses to the open-ended questions regarding the students' general opinion of the intervention were mostly positive. Some students used the following words to describe their reaction to the treatment: "cool," "fun," and "very helpful." When asked what they liked best about the intervention, Jacqueline and Alayna said that it was the opportunity to read in pairs, practice missed words, learn new words, and keep track of their reading rates. Alayna stated that she just "liked getting better at reading." When asked to elaborate, some of their responses included the following statements: "I never realized I was missing so many words"; "I started to pay more attention to what I was reading"; "The charts made me want read more words every day because I wanted my numbers to go up." Charles said that he just liked the opportunity to get help with his reading. He stated, "I just want to practice my reading because I'm not good at it. I get tired of always being the worst reader in the class. I really want to get better." Alayna, Charles, and Jacqueline noted that the program helped to increase their self-confidence regarding reading. Martin liked the reading practice as well, even though he did not think his reading improved that much.

Responses to the question that asked what the students liked least about the Duet Reading included "It didn't last long enough," "Sometimes the stories were kinda boring" or "too easy," and "I don't like reading in pairs. I'd rather read by myself." Responses to the question that asked how Duet Reading affected their reading performance included some of the following statements: "It helped me read faster," "I recognize more words," "I read more," "It helped me with the words I don't know," and "I pay attention to how I pronounce words." Responses to the question that assessed whether their improved

fluency positively affected their ability to understand the passages read were mixed. Martin's comment was, "Reading faster don't help you understand what you're reading because you ain't paying attention to what you read when you read fast." The other participants felt that they were able to better understand what they read because since they "don't have to worry about messing up on a lot of words." One student responded by saying, "It helps me understand what's going on when I read." Overall, the students had positive opinions about the Duet Reading procedure. Even Martin, who did not believe his reading abilities improved, felt he benefited from the practice.

Summary

This chapter summarizes the effect Duet Reading had on students' reading fluency and comprehension. An analysis of group results revealed that a functional relationship did not exists between Duet Reading and the students' oral reading fluency. However, individual results varied. Despite variability in their data, Jacqueline and Alayna' mean WCPM scores increased from baseline to intervention and all participants experienced a decrease in the number of errors made during cold reads from one phase to the next. Only Group 1 was able to going into maintenance, but their fluency gains were not maintained. Pre- and post-test comprehension scores revealed that Alayna, Jacqueline and Martin experienced only modest gains. Student satisfaction data revealed that the students found Duet Reading beneficial and helped them become better readers.

CHAPTER V

DISCUSSION

Even though reading fluency instruction has proven to enhance the reading rates and accuracy of young readers with learning disabilities (Chard, Vaughn, & Tyler, 2002: Kuhn & Stahl, 2003), limited research has been conducted with older struggling readers (McCardle & Chhabra, 2004; Wexler et al., 2010; Valley & Shriver, 2003). This study was conducted to examine the effectiveness of Duet Reading, a variation of a repeated reading intervention, by addressing the following research questions:

1. What is the impact of Duet Reading on the reading fluency of high school students with learning disabilities?
2. What is the impact of Duet Reading on the comprehension skills of high school students with learning disabilities?

Duet reading involves having two students with similar reading levels and oral reading rates reading the words of a graded passage together, with each student reading every other word. Embedded within Duet Reading are a number of teaching strategies geared to adolescents such as peer-mediated practice, goal setting, student choice, and self-monitoring. Duet Reading also uses repeated reading and missed-word drills, two effective interventions for increasing reading accuracy and fluency (NRP, 2000).

Findings Linked to Research Questions

This study attempted to address the impact of Duet Reading on the fluency and comprehension of students with disabilities. Findings for each of the outcome constructs will be discussed separately.

Reading Fluency

The primary goal for using a repeated reading procedure such as Duet Reading is to increase students' oral reading fluency. As a result, the first question addressed by this study examined the impact of the intervention on reading fluency. In a multiple probe across groups of students design, a functional relationship is demonstrated when there are changes in a dependent variable (students' data) as a result of the intervention. In order to demonstrate a functional relationship between Duet Reading and oral reading fluency, specific criteria needed to be met for both groups. The criterion for change was at least ten consecutive data points above the baseline mean. The data show that the criterion of at least 10 data points above the baseline mean of 92 WCPM was met by Group 1. However, to establish functionality, replications are needed to prove that a cause-and-effect relationship exists (Neuman & McCormick, 1995). While Group 1 met the criterion, Group 2 did not. Therefore, a functional relationship between Duet Reading and oral reading fluency was not established. Group 2's data were extremely variable, with considerable data overlap between phases. However, an analysis of individual performance revealed that two of the four students experienced gains in the number of words they read correctly in one minute on fourth grade reading passages. Decreases in errors per minute were also noted for all students during all phases of the study. This

means that as their fluency rates increased, accuracy remained high, an important outcome of any fluency intervention.

Jacqueline and Alayna formed the first group. Their data showed some variability, but they made steady growth throughout the intervention phase of the study. They were the most excited about participating and made every effort to improve their performance from the previous session. Alayna was always concerned about her performance and especially enjoyed tracking her progress. This is consistent with the literature on the motivating qualities of self-monitoring for students with learning disabilities (Reid, 1996). At the beginning of each session, she asked to review her timed readings chart to examine her reading rates. The opportunity to self-monitor and evaluate progress seemed to encourage her. At the end of each session, she set personal improvement goals for the next reading, which is an important outcome for struggling adolescent readers. The following comment reflected her desire to improve her performance: "Tomorrow I want to get five more words right than I did today. Do you think I can do it?" The daily reviews of mispronounced words were very helpful as well. At times during the intervention, however, her WCPM score did decrease. These instances seemed mostly due to extenuating circumstances that affected her concentration such as upcoming tests, poor performance on classroom assignments, apprehension over report card grades, progress reports, excessive homework assignments, etc. Despite these factors, she experienced greater fluency gains than any of the participants when her baseline and intervention performances are compared.

Jacqueline's performance was also variable with more data overlap than Alayna. She was more confident in her reading abilities than Alayna and the possibility of mispronunciations did not cause Jacqueline to hesitate when reading as much as it did with Alayna. She was cooperative and accepting of the treatment and enjoyed recording her progress. The inconsistency in her performance, however, concerned her. On days when her performance was dramatically lower than the previous session, she sometimes made the following comments: "I knew some of those words. I don't know why I missed them. I need to pay more attention to the words," or "This story had a lot of words in it I didn't know." Consequently, at the end of each session she would concentrate on memorizing missed words and, as with Alayna, often set personal improvement goals. Not consistently meeting these goals did not diminish her determination to increase her fluency rate. Since her rates were consistently higher than her partner's, Jacqueline was pleased with the progress she was making.

An examination of Group 1's maintenance phase revealed variable performance as well as a dip in performance. Even though their mean WCPM performance was higher than their baseline mean, it was lower than their intervention mean indicating that the treatment effect was not maintained. Jacqueline and Alayna were very disappointed once they reached this phase of the study because they did not want to discontinue the intervention. Their rate began to fluctuate and the inconsistency of their performance caused them to hesitate during cold reads. Uncertainties about potential mispronunciations seemed to cause them to read with less speed and accuracy, and their performance became inconsistent, fluctuating above and below the original baseline

mean. During the last weeks of this condition, students were preparing for final exams. This may have also affected their reading performance because both were concerned about their ability to pass their end-of-course tests (EOCT) as neither Jacqueline nor Alayna passed their middle school end-of-grade tests or EOCTs taken during their ninth grade year. Failing high-stakes tests could result in students having to repeat courses. These variables may explain their inconsistent performance during the maintenance phase, though the dip in performance could also be due to the inability of the intervention to effect sustained change.

Martin and Charles formed Group 2. They were originally Group 3, but became Group 2 when the original Group 2 was dropped due to poor attendance. Group 2 remained in baseline for 5 months, a long time. Researchers warn against prolonged baseline conditions for students who need intervention on a more immediate basis indicating that it is not always educationally sound (Barlow et al., 2009; Newman & McCormick, 1995). An inordinately long baseline could explain their failure to respond positively to the intervention. Their mean WCPM performance during baseline was initially stable, but began to fluctuate and remained variable during the intervention phase with considerable data overlapping between phases.

Charles and Martin differed greatly in motivation in their daily performance. Charles' effort remained consistent throughout the study, yet his data were variable as well. There was no difference in his score from baseline to intervention (baseline and intervention mean—86 WCPM). Though Charles' reading rate was lower than his partner's, he still gave his best effort during each session and was not overly concerned

with the fact that his reading rates were lower. Comments such as "I want to make sure I don't read a lot of words wrong," demonstrated that he valued accuracy more than speed. Concern about the number of words he mispronounced during each duet read resulted in him looking forward to the daily reviews of missed words. During those reviews, he concentrated on memorizing the words, making comments such as "I'm not gonna miss those words again," or "Did I read the word right?" Graphing his daily cold reads allowed him to monitor his reading rate, but his inconsistent progress was frustrating. When he failed to automatically recognize a word, after the end of a session or cold read he would frequently say, "Aw, man" or "Add that word to the list." It did not keep him, however, from trying to improve his daily performance.

Martin was the least enthusiastic about participating in the study. When initially approached, he refused to be involved because he did not find the intervention appealing. I assured him that he did not have to take part since participation was strictly voluntary. However, we did discuss the potential benefits of fluent reading; that participation in this study could improve his word recognition skills, his ability to read with accuracy, appropriate speed, and with expression. He eventually acquiesced and consent was secured.

After several weeks in baseline, he seemed to become bored with the cold reads. He began focusing on increasing the number of words he read in a minute, without concern for accuracy; though his correct rate was higher, so was his incorrect rate. Even though he was prompted at the beginning of every session to read quickly, but as accurately as possible, he continued in this behavior for several weeks. Student reactivity

to measures is an important issue to consider when using multiple baseline designs. Even though the selection of a multiple probe design reduced significantly the number of baseline data points, given the length of the baseline, the number of measurements opportunities was still too many. The behavior of reading quickly while showing little concern for accuracy continued even after the intervention was introduced. Discussions on the importance of accuracy and prompts to pay attention to the words in the passage initially made little difference in his reading rate during the duet reads because he realized that despite his errors, his WCPM scores were still higher than Charles'. Competition served as his inspiration because he wanted to widen the gap between his reading rate and his partner's. It took several sessions for him to realize that he was needlessly mispronouncing words. As he was exhibiting these behaviors, self-graphing and progress monitoring did little to motivate him to improve his performance. He finally confided to the researcher that the reason he read quickly was due to embarrassment of his poor reading skills. When asked to elaborate, some of his comments included "I don't want nobody to know that I can't read good. I don't always know how to pronounce the words, so when I get to some I don't know, I just skip 'em. Man, it's embarrassing in school when you can't read like everybody else. So I just don't do it." After several reassuring conversations and reminders of the importance and benefits of fluent reading, his effort, attitude, and accuracy eventually improved. He began paying more attention to his charts and used them to monitor his progress. Nonetheless, by the end of the study, his WCPM mean performance during the intervention phase was only four points higher than his baseline mean performance.

It was hypothesized that the introduction of the intervention would result in a stable, steady increase in WCPM from the baseline, and that only minimal overlap between data points collected before and after the intervention would occur. This pattern frequently occurred throughout the majority of repeated reading intervention studies reviewed (Alber-Morgan et al., 2007; Daly et al., 2006; Scott & Shearer-Lingo, 2002; Steventon & Fredrick, 2003; Valleley & Shriver, 2003; Yurick et al., 2006). However, considerable variability occurred in Group 1's intervention data, and in both baseline and intervention for Group 2. The variability of the data makes it difficult to draw conclusions from the results, particularly if the variability were caused by a variable other than the intervention. For example, one possible explanation for this variability was that the passages were incorrectly leveled. However, passage readability, established prior to the study using Microsoft Word's Flesch-Kincaid Readability formula, was rechecked and found accurate. Still, the use of formula software to determine readability is not an exact science because various programs can obtain different scores for the same reading selection (Duffelmeyer, 1985).

Another factor that can cause variability in data including the presence of outliers, is the amount of word overlap among the passages read. Gains in reading speed could be influenced by the degree of word commonality among the passages (Chard et al., 2009; Therrien & Kubina, 2007). When stories contain many shared words, higher WCPM and fewer errors per minute could occur than when passages had few overlapping words. Rashotte and Torgeson (1985), for example, demonstrated that students made positive gains in fluency in text that shared a high degree of word overlap compared to repeatedly

reading text that did not share common words. The higher WCPM for some of the passages could have been due to the fact that these passages contained more common text than other passages.

There is also a possibility that the variability of the data for Group 2 during baseline was due to a practice effect, which can occur when a participant in a study repeatedly performs, in this case, the cold reads. Practice effects are most pronounced when the interval between the two tasks or measures is short (Tanguma, 1999). While a practice effect is less likely to occur when employing cold reads, if there was significant word commonality across passages, student scores could go up, especially given the fact that Martin and Charles participated in cold reads for five months.

Comprehension

The second question addressed by this study examined the effects Duet Reading had on students' reading comprehension. This study was interested in whether there were gains in comprehension as a result of fluency gains. Therefore, only Group 1 demonstrated enough of an increase in WCPM as the result of the intervention to merit inspecting their reading comprehension results. A comparison of their pre- and post-test comprehension scores revealed modest gains. Given that the group received no other reading instruction during the day, the gains may have been due to their fluency gains, but it is impossible to determine this given the study's design. Arguments for no effects may be more persuasive given the fact that other studies have found similar results (Edmonds et al., 2009; Scammacca et al., 2007; Valleley & Shriver, 2003). Correlation studies demonstrate a high correlation (e.g. as much as .85 - .91) between students' oral

reading rate and their performance on standardized tests of reading comprehension (Fuchs et al., 2001; Fuchs, Fuchs, & Maxwell, 1988). However, researchers state that the correlation between oral reading fluency and comprehension seems to decrease as students get older and text get more complicated (Paris et al., 2005). Limited research has been conducted in this area, and researchers have been unable to determine the extent to which oral reading fluency affects comprehension or the extent to which comprehension might influence oral reading fluency (Allinder et al., 2001; Chard et al., 2009). Nevertheless, research concludes that although increased fluency does not automatically result in increased comprehension, it is recognized that fluency plays a facilitative role (LaBerge & Samuels, 1974).

The inclusion of a comprehension component in the intervention coupled with the components of Duet Reading may have resulted in greater gains in comprehension. Several fluency studies that have reported gains in comprehension included a comprehension component in the intervention (Alber-Morgan, Ramp, Anderson, & Martin, 2007; Chard et al., 2002; Fuchs et al., 1999; Harris et al., 2000; Homan et al., 1993).

This study and other intervention research conducted with adolescent struggling readers seems to suggest that interventions with older students with severe reading difficulties may be more effective if they include comprehensive instruction designed to directly support fluency (Edmonds et al., 2009: Scammacca et al., 2007) depending on need. While the data reported here did result in an increase in WCPM for two of its four participants, and a decrease in EPM for all participants, the oral reading rates displayed

by these students at the end of the study were still well below what might be expected from their same-aged peers without disabilities (9th grade: 214 words per minute, 10th grade: 224 words per minute, Carver, 1989; 106+ words per minute, Hasbrouck & Tindal, 2006). A goal of this study was to help older struggling readers read a text with ease so that they could focus more attention on understanding the text. However, when older students read several years below grade level, obviously reading fluency instruction alone is insufficient. Even though the intervention was effective in increasing fluency for some of its participants, improvement in reading performance was not sufficient enough to allow them to overcome their struggles with reading. Nevertheless, reading fluency instruction does offer struggling older readers and their teachers one method by which they can observe growth and set attainable goals. More research is needed in this area to determine the type and intensity of instruction needed to improve the reading performance of adolescent students with learning disabilities in reading.

Overall, the results of this study suggest that for two of four struggling high school readers, who read at the fourth grade level, Duet Reading resulted in an increase in WCPM; while these two students experienced modest gains in comprehension, it is unlikely they were due to the fluency instruction. Additional explicit instruction in vocabulary and reading comprehension strategies combined with continued work in advanced word reading and fluency might very well be needed to truly have an impact on adolescent struggling readers' reading performance.

Social Validity

Student opinions of the study provided some evidence of the social validity of Duet Reading and its components. Each component of the intervention proved to be a contributing factor in the participants' daily performance. An analysis of their responses on the social validity questionnaire and comments made throughout the study reflected an overall positive attitude toward the intervention, its components, and Duet Reading's effect on their reading abilities. Both groups indicated that they liked the self-monitoring and goal-setting components of the intervention. The goal setting, which involved challenging students to improve upon their previous rates, seemed to increase their motivation, sense of competition, and desire to succeed. Goal setting addresses achievement behavior, which concerns an individual's reason for approaching and engaging in learning activities (Fuchs et al., 1997; Mercer et al., 2000; Roberts et al., 2008). The students set daily improvement goals based on their previous session's fluency performance and defined success as either progress toward their goal, attainment of, or improvement of their goals. They all placed value on their effort and the challenge of the task, making their reasons for expending the effort intrinsic.

Some also set goals based on the performance of their partner. Peer-mediated practice was added as a way of facilitating and maintaining a high motivational level. It provided opportunities for cooperative learning allowing the students to be actively engaged in the learning activity (Marchand-Martella, Martella, Bettis, & Blakely, 2004; Morris & Mather, 2008). Struggling readers' motivation and engagement can be increased through meaningful, collaborative learning opportunities (Roberts et al., 2008).

Older students tend to become more motivated and engaged when they interact with one another, responding to texts and ideas worth talking about. Jacqueline and Alayna supported each other during the missed-word drills often congratulating and encouraging one another when missed words were pronounced correctly. Attempts at collaborative learning seemed to increase their willingness to take ownership of their and each other's learning.

Peer-mediated practice also resulted in a degree of competition among the pairs as well. Martin, especially, took great pride in out-performing Charles. However, Martin was not as fond of the intervention as his partner, occasionally indicating that he did not like reading in pairs, but would rather read by himself. This contradicted the research on the effectiveness of peer-mediated practice. However, Martin admitted later in the study that his feelings stemmed from a dislike of reading. Martin shared with the researcher that because he "always had trouble reading words," he often avoided reading aloud. Although his responses to the questionnaire indicated that he did not believe that his reading skills had improved, or that the intervention improved his comprehension, he did concede that Duet Reading caused him to "pay more attention to the words," that he "wouldn't mind rereading the passages," and admitted, after seeing his post-test TORF score, that the intervention did help him "read faster" than prior to the study. Although it was only a two point gain, he admitted to the researcher that he felt he could "read faster than before the study."

The daily charting likewise proved to be extremely motivating for Jacqueline, Alayna, and Martin allowing them to monitor visually their daily progress (Rasinski,

2006b; Sutherland & Snyder, 2007; Therrien, 2004). It gave them an opportunity to take ownership in their achievement and assess their failures. Alayna and Jacqueline frequently commented that they liked the charts because they were able to keep track of how well they were doing. When asked to provide additional comments on their opinions of charting, their responses included "The chart helps me see my progress," "I can see how I'm doing and I like that because I like seeing my progress," and "I like it when I can see that I beat my previous scores."

Student choice, another feature of Duet Reading, allowed the students to choose the passages they read. The sense of autonomy that choice afforded proved to be motivating for the majority of the participants. Providing passages that students want to read is an approach used to improve reading motivation. Research establishes the gains readers with learning disabilities can make when relevant texts are at the core of a lesson (Faggella-Luby & Deshler, 2008). Three of the students liked having the option of selecting passage for each section. Alayna was surprised at the beginning of the study that she would have the option of choosing the passages and commented that she rarely had that opportunity. Choice seemed to inspire some of the students by allowing them to be stakeholders in their own success (Daly et al., 2006; Guthrie et al., 2006). In the Daly et al. (2006) study, choice of instructional antecedents resulted in an increase in their oral fluency rates.

In conclusion, the results of the study show that a functional relationship does not exist between the intervention and oral reading fluency; however, based on the social validity results gathered from the participants, Duet Reading and its components seemed

to reinforce the students' desire to engage in reading. All of the participants wanted an opportunity to improve their reading skills. Even Martin and Charles, who exhibited little to no improvement in WCPM from baseline to intervention, appreciated the reading practice Duet Reading provided. The students agreed that the intervention was helpful and believed that it improved their reading accuracy and speed. Jacqueline, Alayna, and Charles either "agreed" or "strongly agreed" with every item on the questionnaire, revealing their overall positive attitude toward the intervention and its components.

Limitations

The research presented in this study called attention to the need to improve the reading fluency of high school students with learning disabilities in reading; however, several limitations should be considered when interpreting its findings. Student absences interrupted the collection of data during all phases of the study. Whenever a member of a dyad was absent, the session was cancelled. Periodic absences due to extenuating circumstances such as exams, illnesses, emergency meetings, truancy, suspensions, in-school events, and holidays also resulted in missed sessions. An additional factor that interrupted the daily sessions was the time at which the Duet Reading was scheduled. Each student participated in the intervention during their Study Skills period, a class available to students with special needs. However, the course also provided support with students' content area class assignments. Occasionally, participants would miss a session because their class time was needed to complete an assignment or receive testing accommodations. Losing a group and missed sessions caused by unforeseen circumstances caused gaps in the collection of data, which interfered with the consistency

with which the intervention was administered. Thus, it is possible that without these interruptions, the results of the data would have been more robust. These factors also caused the baseline to be extended longer than desired for one of the dyads.

Multiple baseline designs depend on withholding the intervention from each baseline for a period of time, which may be considered unethical, especially if it is clear that the intervention is effective. However, that was not the case here since the intervention was something the students received in addition to their other special education services; it was not part of their IEPs. Nonetheless, delaying the introduction of the intervention for the length of time it occurred in this study was regrettable, and if I were to do it again, I would have taken greater pains to prevent this and possibly selected a different design. Extended baselines are not always pedagogically sound for students who need instructional intervention because effective interventions should not be postponed for behaviors that require immediate attention such as dysfluent reading.

Another major problem with the extended baseline, as mentioned earlier, is student reactivity to measures. After three months in baseline, Martin became bored with the cold reads. The experimenter was concerned that the resulting data would not be an accurate reflection of his oral reading fluency so she had several conversations with him, encouraging him to make his best effort. Unfortunately, adding these conversations represented a change in baseline conditions, which, by design, need to remain constant. This change in conditions appeared to result in some of the variability experienced by Group 2 towards the end of their baseline condition and was a threat to the study's internal validity. The study was attempting to establish a causal relationship between the

intervention and reading fluency. However, since Group 2 did not exhibit a significant increase in WCPM as a result of the intervention, the procedural change did not alter the results. Nevertheless, maintaining procedural integrity is a critical component of single-subject research and certainly should have been maintained with more rigor here.

While a functional relationship between Duet Reading and fluency was not established, Group 1 did meet criteria, indicating that Duet Reading appeared to have a positive effect. However, the potential presence of other outside variables could also have influenced the participants' improvements. For example, extraneous learning experiences such as effective classroom instruction or outside tutoring may have contributed to the participants' accomplishments. Several of the participants sometimes stayed after school for tutoring in various subjects. Jacqueline and Alayna were enrolled in English classes that occasionally required them to read aloud, with error correction provided by their classroom teachers. All of the students also took advantage of an accommodation on their IEPs allowing class assignments and tests to be read aloud, providing them with oral reading models that could have influenced their oral reading performance. In addition, because the students were exposed to text in classes other than English, they were still practicing reading, which may have affected their fluency outcomes. No attempt was made to control for any of these variables.

This study measured only reading rate and accuracy (the number of correct words read aloud in one minute) as a method of assessing the intervention's impact on reading fluency. It should be noted that rate and accuracy are not the only components of reading fluency; meaningful expression (prosody) is often considered a part of reading fluency as

well (Hudson et al, 2009; Rasinski, 2004). The research on the definition of reading fluency revealed that it is a complex, multidimensional construct that incorporates all aspects of proficient reading: accuracy, automaticity, speed of word recognition, and expression. Group 1's comprehension improvement might have been greater with prosody as part of the Duet Reading intervention. Adding a prosody component to the intervention would stress the appropriate use of phrasing and expression. Prosody is an indicator that readers are actively constructing the meaning of a passage as they read (Torgesen & Hudson, 2006). It may serve both as an indicator that students are comprehending as they read and also aid comprehension. Incorporating prosody into fluency interventions is a matter that needs to be addressed in future research.

A limitation of single-subject research is that the results, positive or negative, cannot necessarily be generalized to larger populations due to small sample size. This study only included four participants. While its results failed to meet the criteria required to determine a functional relationship between Duet Reading and reading fluency, two of its four participants with learning disabilities in reading did become more fluent readers. Additional research must be conducted to determine whether older secondary students would experience fluency gains using Duet Reading. Replication with other high school students is necessary to support the use of repeated readings with secondary students.

A repeated reading intervention should demonstrate that readers experience gains in fluency within the curriculum they are working in at school in order for it to be a viable intervention. The repeated reading intervention used in this study accomplished the goal of increasing fluency on students' independent reading level (the appropriate

level to begin building fluency), not at students' grade level. It is imperative that secondary students be able to access grade level texts because overly slow and dysfluent reading is a detriment to reading proficiency and can impede their ability to access the standard course of study. However, to accomplish this, students' reading instruction will need to include other components such as advanced word reading, vocabulary, and comprehension.

Another limitation was that the researcher served as the investigator for the study. Consequently, she had a vested interested in its outcome, which could have resulted in a loss of her objectivity. For qualitative research, subjectivity needs to be maintained and controlled. However, to draw on one's subjectivity in the research process does not always mean that one is not objective, but that one actually comes closer to a truer account (Parker, 2002). The researcher's chosen profession and study topic are a result of subjectivity. As a result, this could make it difficult for her to maintain a professional distance and examine the results with impartiality. Failing to recognize subjectivity could cause the researcher to inadvertently influence the participants' performance and ultimately, the outcome of the study. Nonetheless, bias was controlled somewhat by the fidelity measures which showed, at least for 30% of the sessions observed, the researcher was carrying out the study as proposed.

Finally, there was no assessment of the long-term effects of the intervention. Group 1 was able to go into maintenance, but the phase was insufficient in length to accurately validate the lasting effects of the treatment, though the data collected did show a decided decrease in their performance from intervention to the conclusion of the study.

Implications for Practice

Several important implications can be drawn from this study. First, repeated reading interventions do not appear to be as effective for adolescents with learning disabilities. Certainly the findings here, as well as from other studies, suggests that additional research is required (Chard et al., 2009; Scammacca et al., 2007). Therefore, caution is advised in using them and, they should be conducted along with careful progress monitoring. Given less than dramatic results, other interventions including systematic instruction in multi-syllable word reading, vocabulary and comprehension may be more fruitful.

While there is an undeniable link between fluency and comprehension, improved reading fluency does not automatically result in improved comprehension (Pilulski & Chard, 2005). This finding was supported by this study, albeit in a limited way. The failure to generalize to comprehension may be due to other factors such as working memory or background knowledge, which may play a larger role in comprehending text at the secondary level. Again, to enhance comprehension, teachers may want to combine fluency instruction with word-recognition and comprehension strategy instruction.

Given the limited impact of repeated reading such as demonstrated in this study, and others, teachers may also want to consider having students practice reading the same amount of text non-repetitively (e.g. wide reading) as they would in a normal reading intervention. Homan et al. (1993) examined the effects of repeated reading and nonrepetitive reading strategies (echo reading, unison reading, and assisted cloze reading) on reading rate, error rate, and comprehension. Their results indicated equivalent

benefits for repetitive and nonrepetitive methods as well as a significant improvement in comprehension. Interventions that employ a multicomponent strategy such as the one used in the Homan et al. study, show promise in terms of affecting word accuracy and comprehension. Focusing on multiple components of reading instruction within the same intervention can produce meaningful effects (Scammacca et al., 2007).

Repeated reading may present an additional limitation. Repeatedly reading the same amount of text may not only limit students' exposure to various text structures, vocabulary, and different content matter, but might introduce an element of boredom from reading the same passage several times (Biancarosa & Snow, 2004; Morris & Mather, 2008). This occurred with one of the four students in this study. Duet reading included the additional elements of student choice, peer-mediated practice, progress monitoring, and goal setting to increase students' reading motivation, engagement, and interest, important areas to address for struggling adolescent readers because students who are disengaged from their own learning processes are not likely to perform well in school. The social validity results of this study revealed that these components of Duet Reading assisted increasing student engagement and motivation.

As discussed earlier, one of the reasons that struggling adolescent readers remain behind their peers is their reluctance to practice reading. The less they practice, the wider the gap in their reading ability compared to that of their capable peers. It is essential that an intervention or reading program presented to students is enjoyable and meaningful to them. Overall, Duet Reading proved to motivate the students to practice reading, and reading with a peer with similar reading abilities seemed to create a less threatening

environment. Documenting progress by graphing their success can create experiences that are satisfying to older students with reading difficulties.

This study demonstrated the importance of using curriculum-based measures (CBM) such as the grade-level probes to assess reading progress. Curriculum-based measures allow students and teachers to chart and monitor progress and provide, as this study proved, motivational feedback to students (Deno et al., 2001). Overall, students enjoyed the opportunity to monitor their progress and chart their results. CBMs can initiate dialogues between the students and their teachers to discuss progress and make decisions with respect to increasing the intensity of the intervention or changing strategies if appropriate progress is not being made.

Special education teachers working at high schools are acquainted with the challenge of providing remedial reading instruction to students with disabilities who read at very low levels. Realities such as chronic absenteeism and scheduling challenges often result in special education services that mirror low-intensity content-area tutoring with limited opportunities to practice reading. Perhaps the most significant implication of this study is that these brief approaches are not likely to meaningfully influence the reading performance of students with severe reading impairments. Although the demands of completing credits toward graduation make it challenging for teachers to deliver the intensive reading instruction needed by older struggling readers, the consequences of not serving these students appropriately are severe for both the students and for society as a whole.

Recommendations for Future Research

Despite the plethora of research regarding effective fluency interventions for beginning readers, there is a relative lack of research regarding how and if fluency instruction will improve struggling adolescent students' ability to read fluently, accurately, and with comprehension.

A repeated reading procedure like Duet Reading may benefit a certain type of reader. The results showed that Alayna and Jacqueline experienced gains in reading fluency, but Martin and Charles did not. It is important to conduct more studies in order to understand why some older students with reading disabilities may respond to fluency interventions and why other may not. Perhaps, an in depth analysis of the participants' cognitive, verbal, and historical profiles could be done in conjunction with fluency interventions to gain a better understanding about the type of student who will respond to an intervention as well as those who will not.

Fluency-building interventions normally involve reading passages at students' independent reading level. Pretesting determined that all participants attained 95% reading accuracy on fourth grade reading passages, which were used as probes throughout the study. However, a software program determined the readability of the passages, which is not an exact science given that readability can vary with the program used. This could possibly explain the variability in the students' performance. The use of standardized passages calibrated for the fourth grade level could have eliminated the possibility of incorrectly leveled passages and should be used in future studies.

Having access to passages at struggling adolescent readers' reading level is important to fluency building; however, those passages do not accurately represent the type of reading high school students encounter on a daily basis. Secondary students need to be able to access grade level text. High school-level passages provide a realistic measure of gains or losses with respect to typical daily reading materials. Research needs to be conducted examining the effect of repeated readings of text at students' ability levels on their ability to read grade-level texts. The students in this study often asked if they could practice reading using passages from their content-area classes. Perhaps future studies could employ generalization probes using students' grade-level texts.

The intervention used in this study did not include instruction in word-level skills, vocabulary knowledge, or strategies to enhance comprehension. Syntheses of intervention research conducted with adolescent struggling readers (Edmonds et al., 2009; Scammacca et al., 2007) suggest that interventions with older students with severe reading disabilities may be more effective if they include instruction designed to support decoding, vocabulary and reading comprehension. An important characteristic of fluent reading is the ability to decode and comprehend simultaneously. brought attention to

Considering the results of this study, another question for future research would be a direct comparison of repeated reading and nonrepetitive reading as in the Homan et al. (1993) study. Certainly, it is possible that more practice with text will result in improving students' reading performance. Finally, because reading fluency is now conceptualized as an important indicator of reading competence (Fuchs et al., 2001), and because reading fluency growth rates for readers in grades 1-8 have been developed at the

national level, it has become easier to determine oral fluency goals for students who are reading at a particular grade level. The use of reading norms can inform researchers and practitioners as to (a) how much growth the students should make, (b) the level of intervention effectiveness, and (c) where struggling readers stand in relation to their grade-level peers. As more is learned about the difficulties experienced by struggling older readers, researchers can explore the use of fluency norms to guide decisions about intervention outcomes.

A review of student performance and their responses to the social validity questionnaire brought attention to the relationship between reading achievement and motivation. Although the students were surveyed on their impressions of Duet Reading and how it affected their reading abilities, their motivation to read was not fully addressed. Their desire to engage in reading seemed to play a role in their daily effort. Future research should be conducted that closely examines the influence motivation has on students' reading fluency performance. In order to teach reading effectively, teachers must provide an environment that not only develops fluent reading skills, but also sparks a strong desire and motivation to read. It is important to analyze academic motivation because of its significant influence on learning at school (Wigfield & Tonks, 2002), making learning and motivation two potential variables for joint analysis. Future studies could also include comprehensive interviews with students, their parents, and their teachers, which may facilitate the design and implementation of a more successful fluency building intervention.

The participants represented various genders, ethnicities, and diverse socioeconomic backgrounds. In addition, all came from single-parent households. These variables could have had an impact on their performance or potential to achieve. For example, gender is a variable that has been found to be related to differences in motivational functioning and self-regulated learning, especially for secondary students (Wigfield & Tonks, 2002). The females in the study demonstrated different attributional patterns from the boys. The girls tended to make more of a consistent effort in their performance, made external attributions for their successes and failures, and showed greater intrinsic motivation. The boys, on the other hand, seemed to appeal more to ability as a cause of their academic achievement and showed greater extrinsic motivation. Future studies should address the influence of these factors as well as investigate differences resulting from socioeconomic status (SES) and ethnicity. For example, future studies should include a broader range of ethnic groups and investigate the relationship of SES not only with reading fluency achievement, but also with motivational correlates.More research is needed on these variables to effectively design reading fluency interventions that serve a diverse population of readers.

Conclusion

Adolescent struggling readers have a myriad of challenges to face in school since successfully accessing the high school curriculum is based on effective reading skills (Dudley, 2005). Yet, oral reading strategies are not commonly taught at the high school level. The ability to read effectively is an essential skill for academic success. It is imperative that classroom teachers be supplied with research-based supplemental

strategies specifically geared toward increasing the reading fluency and comprehension skills of adolescent struggling readers.

This study extended the research by examining the effects of Duet Reading on the reading fluency and comprehension of secondary students with reading disabilities. Duet reading is a simple repeated reading intervention designed to increase a reader's fluency, and potentially comprehension. The study resulted in increased words correct per minute for Group 1, but not for Group 2. As a result, a functional relationship was not established. All participants experienced a decrease in errors per minute throughout all phases of the study; three experienced modest gains in reading comprehension. Although there is no prior research on this intervention, there was research suggesting the effectiveness of repeated reading strategies and this research had demonstrated its effectiveness with a variety of populations and classroom settings (Mercer et al., 2000; O'Connor, White, & Swanson, 2007; O'Shea et al., 1987; Valleley & Shriver, 2003).

The findings of this study indicate that while attention needs to be given to reading fluency at the high school level, the best way to do that for struggling high school students with reading disabilities has yet to be determined. As time in the high school schedule is clear, it is unclear at this time whether instructional time with these students may be is better used by addressing word-reading accuracy, fluency, and comprehension through a wide range of different texts rather than just rereading the same text multiple times. To conclude, fluency building remains one potentially useful component of a complete reading program, but its precise contribution to helping adolescent readers is unclear at this time. It is clear that closing the gap between older struggling readers and

their normal-reading peers is unlikely to occur unless instruction incorporates all aspects of reading, depending on need, but regardless of age.

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Appendix A

Sample Reading Passage

The Doughnut Shop 3

It smelled wonderful in the shop. There were chocolate covered 13
doughnuts, glazed doughnuts, sugar doughnuts, and plain cake 21
doughnuts. Danny could tell he was going to like this job! He loved to 35
eat doughnuts. 37

Mrs. Haney didn't waste any time in training Danny on the 48
store's equipment. It seemed easy enough. There was one machine for 59
mixing the batter, one for pressing the doughnut shapes and one for the 72
icing. All Danny had to do was push some buttons and arrange the 85
doughnuts on trays. No problem, he thought to himself. 94

Several days went by without incident. Then, on the last day of 106
his first week, disaster struck. It all began when Mrs. Haney became 118
ill. A customer drove her to the hospital. Danny had just begun to mix 132
enough dough for eleven dozen doughnut, so he couldn't just leave. 143
He decided to try to manage the shop until he had sold the first batch of 159
doughnuts. Besides, it had been pretty easy up to that point. 170

After the dough was thoroughly mixed, Danny poured it into the 181
pressing machine. He turned on the switch and doughnut shapes came 192
out. About two dozen came out just right, and then they started 204
coming out in big blobs! Danny tried to turn off the machine, but they 218
just kept coming. Danny became frantic. What could he do? 228

Words
Correct _____

Appendix B

Parental Consent

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

Parental Consent Form

Project Title: Developing Reading Fluency in High School Students with Reading Disabilities

Project Director: Angela Jones

Participant's Name: _____

Dear: _____

Purpose: This letter is being sent to you to invite your child to participate in a research study, which is an organized activity that is done to determine an answer to a question or problem. The purpose of this study is to determine whether a reading strategy called "Duet Reading" will improve the reading fluency of high school students with reading difficulties. Duet reading is a reading strategy that involves two readers alternately reading every other word of a passage. Fluent reading occurs when words are recognized automatically. With automatic word recognition, reading becomes faster, smoother, and more expressive. Improved fluency may help your child read better and with improved understanding. The Duet Reading sessions will take place daily in my office for approximately 20 to 30 minutes a session for up to twelve weeks during your child's Study Skills class. Each student will participate in no more than 60 sessions during this semester and the total commitment time will be no more than 30 hours. At the end of the study, your child will be asked to describe his/her feelings about the strategy. My role at Glenn High is to serve as the Exceptional Children's Case Manager. I am also a student at the University of North Carolina at Greensboro. I do not teach your child directly, but I will be conducting this research study.

Risks: There is minimal risk posed by participating in this research study. There is a slight chance that someone may find out that your child is participating in the study. However, every effort will be made to maintain your child's confidentiality.

Benefits: I do not promise that your child will get any benefit from helping with this study. However, the strategy may result in your child being able to recognize words more easily and improve his/her ability to comprehend reading materials. The results of our study will add to the literature on treating adolescents that struggle with reading and will benefit children in the future.

Costs: There are no costs to you or payments to you or your child as a result of participating in this study.

Confidentiality: All information obtained in this study is strictly confidential unless disclosure is required by law. Consent forms, along with the results and computerized records, will be kept secure and confidential in a locked cabinet on UNC-G's campus in the Ferguson Building in room 206 for five years after completion of this study. After that time, all paper and typed records will be shredded and computer data erased.

As a part of normal academic practice, students are periodically given assessments to measure their academic achievement and progress. Information from reading assessments was used to determine your child's eligibility for the study and will be used in the study's results. However, any information with your child's name attached will not be shared with anyone. I will protect your child's confidentiality by coding his/her information with a pseudonym so no one can trace the results to his/her name. However, a file linking your child's name with its pseudonym will exist, but will be kept in a folder separate from the study's results. The principal investigator and I will be able to trace the results of the study to the students, but the information will not be made available to anyone else. The data will be kept in another secure file separate from the study's data in the same room as the study's results. The data gathered from this study could be used in reports, presentations, and publications but your child will never be individually identified.

Voluntary Consent/Questions: Participation is voluntary. Your decision whether or not to participate will not affect your child's grade or future relations with Robert B. Glenn High School. You have the right to refuse to allow your child to participate or withdraw him or her at any time, without penalty. If your child chooses to withdraw, it will not affect you or your child in any way. If you or your child chooses to withdraw, you may request that any data which has been collected be destroyed unless it is in a de-identifiable state.

The University of North Carolina at Greensboro Institutional Review Board and Winston-Salem/Forsyth County Research Studies Review Board, which makes sure that research involving people follows federal regulations, has reviewed this research. The researcher conducting this study is Mrs. Angela Jones. If you have any concerns about your child's rights or how you are being treated, please feel free to contact Eric Allen in the Office of Research and Compliance at UNCG at (336) 256-1482. Questions about the project or benefits or risks associated with being in this study can be answered by Dr. William Bursuck, the principal investigator, who may be contacted at (336) 334-3222. Feel free to contact Angela Jones as well by calling (336) 771-4500 or by email at ajones@wsfcs.k12.nc.us if you have questions.

If significant new information relating to the study becomes available which may relate to your willingness allow your child to continue to participate, this information will be

provided to you. By signing this consent form, you are agreeing that you have read it or it has been read to you, you fully understand the contents of this document, and consent to your child taking part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are the legal guardian or parent of the child who wishes to participate in this study described to you by Angela Jones.

Signature of Participant's Legal Guardian	Date

Appendix C

Student Assent

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
Children's Assent Form

Dear: _____

My name is Mrs. Jones and I'm the Exceptional Children's Case Manager here at Glenn High. I'm also a student at the University of North Carolina at Greensboro. I want to tell you about a research study I am conducting. A research study is a special way to find out about something. I am trying to discover ways to help students who have difficulty reading become better readers and read with fluency. To be able to read fluently means you can read stories smoothly, quickly, and with good expression. Being able to read fluently can also help you better understand what you are reading. You are being asked to join this study because I want see if a method called "Duet Reading" helps high school students who struggle with reading become better readers. Duet Reading is a strategy that improves your ability to read fluently. It involves two students reading every other word in a passage for one minute. I realize that I'm not one of your classroom teachers, but I am very concerned about helping students that struggle with reading. I would really appreciate your help in discovering if Duet Reading would be an effective strategy for improving reading skills.

Your parent has given permission for you to participate in this study and has signed a form like this one. However, you do not have to participate in the study if you don't want to. If you say "no," you will not be punished. Even if you say yes now, but change your mind during the study, you will not be punished. Leaving the study will not affect your grade and I will not be upset. However, if you agree to be in my study, we will work together each day during your Study Skills class for 20 to 30 minutes a session for about twelve weeks. You and another student will be participating in the study together. Each time we meet, I will record both of your reading rates to see how much improvement the two of you are making. Reading rate is the number of words that can be read correctly in one minute. You and I will chart that information so you can monitor your progress.

I cannot promise that you will receive any benefit from participating the study, but there is a chance that participation may lead to improved reading skills.

You are free to ask questions about this study at any time and remember that you can come out of the study at any time. Remember, your participation is voluntary. If you have any concerns about your child's rights or how you are being treated, please feel free

to contact Eric Allen in the Office of Research and Compliance at UNCG at (336) 256-1482. Questions, concerns, or complaints about this project or benefits or risks associated with being in this study can be answered by Dr. William Bursuck, the principal investigator, who may be contacted at (336) 334-3222. You can also stop by my office, room 108, with your questions.

Throughout this entire study, every effort will be made to make sure that your results remain confidential. However, there is a slight risk that someone may find out who you are. Nevertheless, every effort will be made to make sure that no one will know that you are participating in the study.

Signing this form means that you have read it or had it read to you and that you want to participate. If you don't want to be in the study, don't sign this form. Remember, participating in the study is up to you, and no one will be upset if you don't sign this form or even if you change your mind and decide to drop out later.

_____ Date _____

Signature of Participant

Appendix D

Adult Assent

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

Adult Consent Form (For 18 year old participants)

Project Title: Developing Reading Fluency in High School Students with Reading Disabilities

Project Director: Angela Jones

Participant's Name: _____

This is a research study, which is a way to learn information about something. I'm conducting this study because I want see if a reading strategy called Duet Reading will help high school students that struggle with reading become better readers. Duet Reading is a strategy that improves a student's ability to read fluently. When students read fluently, they are able to read phrases and sentences smoothly and quickly, while understanding them as expressions of complete ideas. You were selected to participate in this study because you have been identified as a struggling reader. Duet Reading has the potential to help students who struggle with reading become better readers. It involves two students reading every other word in a passage for one minute. I realize that I'm not one of your classroom teachers, but I am very concerned about helping students that struggle with reading. I would really appreciate your help in discovering if Duet Reading would be an effective strategy for improving reading skills.

You have the right to refuse to participate or to withdraw at any time, without penalty. If you do withdraw, it will not affect you in any way. If you choose to withdraw, you may request that any of your data which has been collected be destroyed unless it is in a de-identifiable state. It is your choice whether to be part of the study or not. You may decide not to participate even after you sign this form. Leaving the study will not affect your grade and I will not be upset. However, if you agree to participate in this study, we will work together each day for 20 – 30 minutes a session for about twelve weeks. You and another student will participate in the study together. Each time we meet, I will record both of your reading rates to see how much improvement the two of you making. Reading rate is the number of words that can be read correctly in one minute. You are I will chart that information so that progress can be monitored.

Feel free to ask questions about the study at any time and remember that you can leave the study at any time because your participation is voluntary. Throughout this entire study, every effort will be made to make sure that your results remain confidential. The

results of this research may be published in a professional journal after it has been completed, but no personal information about you will be included in any part of the report. All information obtained in this study is strictly confidential unless disclosure is required by law. A file linking your name with a pseudonym will exist, but will be kept in a folder separate from the study's results. Consent forms, along with the study's results and computerized records, will be kept secure and confidential in a locked cabinet on UNC-G's campus in the Ferguson Building in room 206 for five years after completion of this study. After that time, all paper and typed records will be shredded and computer data erased. There are minimal risks posed by participating in the research study. There is a slight risk that someone may find out who you are. Nevertheless, every effort will be made to make sure that no one will know that you are participating in the study. Nevertheless, every effort will be made to make sure that no one will know that you are participating in the study. I cannot promise that you will receive any benefit from participating in the study. I cannot promise that you will receive any benefit from participating in the study, but there is a chance that participation may lead to improved reading skills. There are no costs to you or payments made for participating in this study.

If you have any concerns about your rights, how you are being treated, want more information, have suggestions or if you have questions, please contact Eric Allen in the Office of Research Compliance at UNCG at (336) 256-1482. Questions, concerns or complaints about this project or benefits or risks associated with being in this study can be answered by Dr. William Bursuck, the principal investigator, who may be contacted at (336) 334-3222, or you can contact me in my office, room 108.

If significant new information relating to the study becomes available which may relate to your willingness to continue to participate, this information will be provided to you.

By signing this consent form, you are agreeing that you read, or it has been read to you, and you fully understand the contents of this document and are openly willing consent to take part in this study. All of your questions concerning this study have been answered. By signing this form, you are agreeing that you are 18 years of age or older and are agreeing to participate, or have the individual specified above as a participant participate, in this study described to you by Mrs. Jones.

Signature: _____ Date: _____

Appendix E

UNCG Institutional Review Board

THE UNIVERSITY of NORTH CAROLINA
GREENSBORO

OFFICE OF RESEARCH COMPLIANCE
2718 Beverly Cooper Moore and Irene Mitchell Moore
Humanities and Research Administration Bldg.
PO Box 26170
Greensboro, NC 27402-6170
336.256.1482
Web site: www.uncg.edu/orc
Federalwide Assurance (FWA) #216

To: William Bursuck
Specialized Education Services
341A Curry Building

From: UNCG IRB

Authorized signature on behalf of IRB

Approval Date: 7/27/2009
Expiration Date of Approval: 7/26/2010

RE: Notice of IRB Approval by Expedited Review (under 45 CFR 46.110)
Submission Type: Initial
Expedited Category: 7.Surveys/interviews/focus groups
Study #: 09-0226

Study Title: Developing Reading Fluency in Adolescent Struggling Readers

This submission has been approved by the IRB for the period indicated. It has been determined that the risk involved in this research is no more than minimal.

Study Description:

The purpose of this project is to examine the impact of a repeated readings intervention called Duet Reading on the oral reading fluency and comprehension skills of high school students experiencing difficulties in reading.

Regulatory and other findings:

This research, which involves children, meets criteria at 45 CFR 46.404 (research involving no greater than minimal risk). Permission of one parent or guardian is sufficient.

Investigator's Responsibilities

Federal regulations require that all research be reviewed at least annually. It is the Principal Investigator's responsibility to submit for renewal and obtain approval before the expiration date. You may not continue any research activity beyond the expiration date without IRB approval. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

When applicable, enclosed are stamped copies of approved consent documents and other recruitment materials. You must copy the stamped consent forms for use with subjects unless you have approval to do otherwise.

You are required to obtain IRB approval for any changes to any aspect of this study before they can be implemented (use the modification application available at http://www.uncg.edu/orc/irb.htm). Should any adverse event or unanticipated problem involving risks to subjects or others occur it must be reported immediately to the IRB using the "Unanticipated Problem/Event" form at the same website.

CC: Angela Jones

Appendix F

Winston-Salem Forsyth County Approval

Winston-Salem/Forsyth County Schools
P. O. Box 2513
Winston-Salem, NC 27102-2513
(336)727-2816 Fax (336)727-2008
website: wsfcs.k12.nc.us

Project ID 2009-72

Approval Form for Research Project to be Conducted In the Winston-Salem/Forsyth County Schools

Name of Principal Investigator: Angela Jones

Advisor's Name (if student): Bill Bursuck

Research/Educational Institution University of North Carolina at Greensboro

Research Title: Developing Reading Fluency in High School Students with Reading Disabilities

The above project has been approved by the Winston-Salem/Forsyth County Schools Administrative Offices. Stipulations to this approval, if any, are noted below. ***The investigator understands that the principals have the authority to grant or deny permission for the study to be conducted in their schools.***

Project Timeline: 9/28/2009 – 12/18/2009

Stipulations:

Data Confidentiality Form Needed? (Check if yes) :

Marty Ward, Ph.D.
WSFCS Research & Evaluation

May 22, 2009
Date

Appendix G

Oral Recruitment Script

Oral (Recruitment) Script

Project Title: Developing Reading Fluency in High School Students with Reading Disabilities
Project Director: Angela Jones
Name of Participating Institution: The University of North Carolina at Greensboro

Hello (student's name), my name is Mrs. Jones. I'm the Exceptional Children's Case Manager here at Glenn High. I'm also a student at the University of North Carolina at Greensboro and I'd like to ask you to help me with a project for a research study I'm conducting this semester. A research study is a way to learn information about something. I'm conducting this study because I want see if a reading strategy called Duet Reading will help high school students that struggle with reading become better readers. You were selected as a possible participant because you have a history of struggling with reading.

Duet Reading is a strategy that improves a student's ability to read fluently. When students read fluently, they are able to read phrases and sentences smoothly and quickly, while understanding them as expressions of complete ideas. Duet Reading involves two students taking turns reading every other word of a passage. Each student reads as many words of the passage as they can in one minute.

The study will take place every day in my office during your Study Skills class. It will take about 20 – 30 minutes a session and will last for about 12 weeks. You will not get paid for participating in this study. However, Duet Reading may improve your ability to recognize words quickly and better understand what you read. To determine who will participate, I need to give you two tests – the Test of Oral Reading Fluency and the Woodcock Reading Mastery Test. The Test of Oral Reading Fluency will measure your oral reading rate, which is the number of words you can read correctly in one minute. The Woodcock Reading Mastery Test will measure your reading ability. These are tests that your teachers were going to give you anyway. However, their results will determine who will or will not participate in my study. Only students with similar reading levels and reading rates will be invited to participate. If you are chosen, a letter will also be sent home to your parents/guardians for them to sign giving their permission for you to take part in the study. You will also be given a letter to sign stating that you agree to take part in the study. However, at any time during the study, you or your parents have the right to change your minds and ask to no longer participate. You will not be punished for leaving, your grade in Study Skills will not be affected, and I will not be upset. If you decide that you don't want to participate in the study after we finish the test today, just let me know. But, right now, all I'm going to do today is give you the tests. I'll get back with you in a few days to share your results and to let you know if you will be invited to

participate in the study. Do you have any questions before we get started? Okay, let's begin.

Appendix H

Procedural Integrity Checklist

Independent Observer _____ Date _____

Instructions: Please check "yes" or "no" after each statement below as it appropriately represents each of your observations of the participant(s) and researcher. Divide the number of steps completed by the number of steps planned to calculate procedural reliability.

INTERVENTION SEQUENCE		
Cold Read	**Yes**	**No**
1. Students are allowed to choose the passage.		
2. Instructions are provided to student(s) for cold read.		
3. Each student reads for one minute independently while researcher follows along with her copy.		
4. Researcher crosses errors with a single slash (/) sign for each word the student misses or miscues and records all missed words.		
5. No feedback is provided on missed words.		
6. Researcher calculates WCPM and shares score with each student.		
7. Student graphs individual scores on fluency chart.		
Duet Reading Session		
1. Instructions are provided to student(s) for duet read.		
2. Using the passage chosen for the cold read, students perform the duet read three times for one minute, with each student reading every other word.		
3. Researcher followed along on researcher's copy during each reading.		
4. Researcher crosses errors with a single slash (/) sign for each word the student misses or miscues and records all missed words.		
5. No feedback is provided for mispronunciations made during the duet readings.		
6. Researcher calculates WCPM for final duet reading and shares with each student, but scores not graphed.		
7. Missed words are reviewed.		
8. After third reading, each student reads the passage in its entirety.		
% Procedural reliability for session.		

Appendix I

Social Validity Questionnaire

Social Validity Questionnaire

Student: _____ Date: _____
Listed below are statements about Duet Reading. I am interested in your opinion on each. Please read each carefully, then circle the letters that show how much you agree or disagree with each statement. Use the following scale:

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

Example: **I think that rap music is the best type of music**.

If you are *really positive* that rap music is *not* the best type of music, circle S*trongly Disagree.*
If you *think* that rap music is not all that great, circle *disagree.*
If you *can't decide* wither or not it is the best, circle *undecided*.
If you *think* that rap music is good, but maybe not great, circle *agree.*
If you are *really positive* that rap music is the best, circle *strongly agree*.

1. I feel that Duet Reading helped me read with greater accuracy.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

2. Reading a passage several times made me read a lot faster.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

3. I really liked rereading the passages.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

4. The Duet Reading intervention was easy to learn

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

5. Having the teacher tell me the words I missed helped me read with fewer mistakes.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

6. I made progress by rereading passages and reviewing the words I missed.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

7. When I read faster, I can understand what I read better.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

8. I really liked seeing the progress I was making on the graph.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

9. Keeping track of my daily fluency rate motivated me to read more accurately and quickly.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

10. I would like to keep rereading passages, reviewing the words I missed, and seeing my progress on a graph.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

11. Duet Reading has helped me read faster than I could before.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

12. I read better now than I could before.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

13. When I read, I recognize more words than I used to.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

14. I enjoyed reading more now than I used to.

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

15. I would like to continue Duet Reading next year,

1	2	3	4	5
Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

---

16. What do you like best about Duet Reading? Why?

_____

_____

17. What did you not like about Duet Reading? Why?

_____

_____

18. How has your ability to read words more fluently affected your ability to understand the passages we read?

_____

_____

19. How do you think this study has affected your reading performance?

_____

_____

20. What is your overall opinion of Duet Reading?

_____

_____